

# AVIATION

*The Oldest American Aeronautical Magazine*

JUNE 11, 1928

Issued Weekly

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A Vought "Corsair" (Pratt & Whitney "Wasp") flying over Guantnamo Bay

VOLUME  
XXIV

## Special Features

NUMBER  
24

The Bellanca Sesquiplane  
The "Wasp" Series "B" Engine  
The Problem of Aviation Insurance

AVIATION PUBLISHING CORPORATION  
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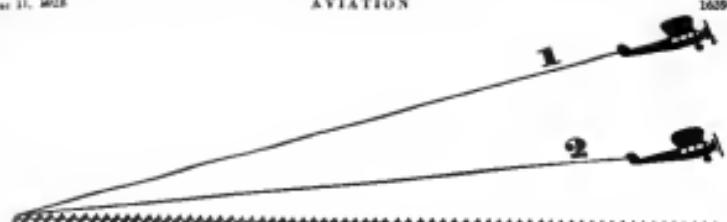
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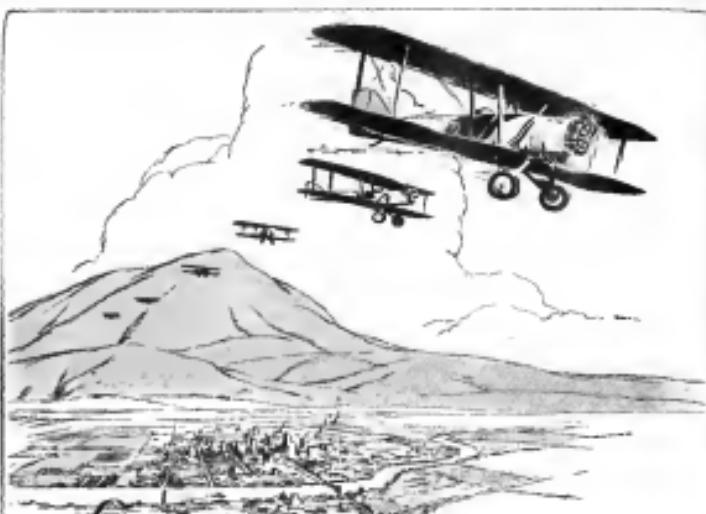
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June 11, 1938

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# AVIATION

The Oldest American Aeronautical Magazine

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Vol. XXIV June 11, 1938 No. 24

## Index to Contents

EDITORIAL	3673
THE HELLERICO DISCIPATE	3674
FLIGHTS ANALYSIS	3676
THE KINNEY "CONTINUUM"	3677
THE "WASP" SERIES "B" REVISITED	3678
THE PROBLEM OF AVIATION EDUCATION	3680
THE BOEING 307 FLIES HIGH	3681
NEWS	3682 TO 3703
LAST MINUTE DRILLS	3698
FOREIGN NEWS	3729
BOOK REVIEWS	3732
AIRPORTS AND AIRWAYS	3733
INDEX TO ADVERTISERS	3737

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# AVIATION

The Oldest American Aeromotical Magazine

Vol. XXIV

JUNE 11, 1938

No. 24

## Very Much Neglected

FOR SOME considerable time following the World War no concerted effort was made to develop seaplanes. Last year, however, considerable experimental work was done in this direction and at the Detroit Show there were several landplanes fitted with pontoons in addition to two amphibians. The prices ranged from \$4,000 for the OR amphibian to \$65,000 for the luxurious flying Commercial Amphibian. There is little doubt that from now on there will be a continuous growth, no over water flying offers many advantages.

The large growth of commercial flying last year was made possible by the experience which was gained in previous years. In considering ocean liner flying it must be remembered that there are no such accommodations of passengers as to how to operate properly. The few gasoline operators have been using war surplus flying boats and seaplanes and have had little opportunity to develop and perfect for commercial use the boats and seaplanes which are to replace the war surplus material. It has taken a long time to develop the equipment that is replacing the war surplus material, and there is no reason to believe that this new water equipment will prove perfectly satisfactory right off the bat. But within a very few years we may expect to see a considerable amount of over water flying.

One definite thing that can be done to hasten the inevitable widespread use of water craft is the development of proper facilities for the handling and storage of planes. Municipalities are spending millions in developing airports, but the development of bases for the operation of seaplanes and flying boats has practically been neglected although the cost is only a fraction of that of buying and building an airport.

## Climbing off the Drome

ALTHOUGH PROOF showing statistics are unavailable, it is safe to say that a goodly portion of airplane accidents are caused by engine failure during a steep climbing turn just after the take off. "Climbing off the drome" has a kick all its own. It is not an uncommon practice among pilots and it is a quick way of clearing the field and getting back into position to "set her down again" if needs arise. However, particularly in the case of low powered planes, until the climbing turn is well completed the pilot, in his experienced or otherwise, is taking an unnecessary chance. A plane is a climbing craft at a low altitude and heading down wind is in a most unhealthy position when the engine

goes dead. And in a good many cases when such a thing happens all the piloting skill in the world cannot totally avoid the crash that follows.

It has been claimed and proved that the Boulleau Page slotted wing and the Fokker wing will not allow the plane to go over an wingtip and into a spin should the wings fall on a steep climbing turn or the plane be otherwise stalled. Yet at the same time neither of these designs prevent the plane from "spinning" if there is not sufficient altitude in which to gain flying speed the spin follows. Perhaps less serious, but a definite consideration.

The greed to which those respond in the aeronautic industry aside is the absolute crash factor. Such is so it follows that any rating that tends to prevent crashing is not a red tape instruction but a progressive step in the betterment of aeronautics in general.

## Learn the Details

THE AUTOMOBILE has reached a standardization of chassis, gear shafts, and brake arrangement which enables an experienced driver to run any car without previous instruction. To some extent the same thing is now true of the control system of an airplane and an experienced pilot can shift from one plane to another, and under normal circumstances he can do it quickly. This should not however deplete a pilot who is taking delivery of a new plane into thinking that he knows everything about it. There is no standardization of the instrument panel or instruments and every manufacturer has a different idea about gasoline gauges and reserve tank valves.

Recently two three-engaged planes had engine failures because the pilots had taken for granted that they understood the necessarily complicated system of reserve tanks and gauges. Another experienced pilot had a forced landing at night because he did not know the proper setting for the reserve tank cock. These examples might be multiplied indefinitely and there would certainly be a long list of errors which could be attributed to carelessness in learning the details of a new plane.

Manufacturers and dealers should most certainly have a printed instruction book which would bring out the special points that ought to be learned about the plane. They should see that these points are brought to the attention of the pilot. But if the pilot is sure in advance that he knows all that there is to be known no amount of system or instruction will persuade him that there may be something that he could learn.

# The Bellanca Sesquiplane

**Model "K"** Includes Several Original Features in Airplane Design and is Powered with a Single 500 Hp. "Hornet" Engine

By RICHARD M. MOCK

**T**HIS model, a long distance type purchased by Gustave Schell of New York City for a proposed flight to Russia, is powered with a single 500 hp Pratt & Whitney Hornet engine. The plane is perhaps one of the most original designs, following accepted principles never produced. The wing arrangement appears to be a further development of the lifting strut made famous by Giuseppe M. Bellanca and now used as extensively in this country and being copied abroad. The landing gear is of cantilever design and retracts into the lower wing strut out of the slipstream, reducing the parasite resistance apparently. The upper portion of the upper wing panel is a motor mount, constructed with sheet aluminum with gusset-tight seams, forming a very efficient type of wing tank. The fuselage follows usual Bellanca design and is claimed to produce some lift so that practically every exposed portion of the plane contributes to the lift of the craft.

The plane has a very pleasing appearance, the colors part of the wings and the tail surfaces are a bright yellow, while the struts are gray, contrasting with the blue fuselage and polished aluminum engine cowling. The Hornet engine is mounted on the nose of the fuselage, with the glass-enclosed cockpit located behind the engine and in front of the main fuel tank of about 600 gal. Located this tank in a large compartment for the radio operator and navigator. The plane has been fitted for a long distance flight and, thus equipped,



Circa 1938 front view showing the "Hornet" engine and canopy or bower strip for landing wheels

weights 4,800 lb. empty with tanks, instruments, fuel tanks, etc. The tanks have a total capacity of 1,800 gal of gasoline which should ample for a range of approximately 3,500 m. No lead tank has been made at the time of this writing, but it may be possible to add about 200-3 gal. cans of gasoline, thus bringing the full load up to about 15,000 lb., with still a conservative load factor to provide a safe take off. The estimated weight of the same model, as a conventional passenger

plane for 14 people, or about 2,000 lb. per load, is 7,000 lb. With this load it is calculated to have a high speed at 135 m.p.h. and a landing speed of 54 m.p.h. The climb should be up to 800 f.p.m. and the service ceiling 15,000 ft. It is understood that a similar model, with a 400 hp. Wasp engine



Side view of the Bellanca Sesquiplane. The plane has been shortened the "Hornet".

and fixed, or monostatic landing gear, is under construction to a passenger carrying type.

The model is easy to sail as having keelless. The lower part of the upper wing is pin pointed to the inner bay, the outer bay is supported by the so-called auxiliary wing (one strut) from the inner bay of the lower wing in a point at about 70 per cent of the semi-span of the upper wing. The upper wing has a considerable overhang and has a total span of 64 ft. 10 in. The auxiliary wing has a double taper that is, it tapers both in thickness and is slanted. At the nose it has a chord of 20 in. equal to that of the lower wing and at a point about five feet below the main or upper wing, where the lift strut already terminates, the chord is 28 in. This here it branches into two slantwise members, each going to one of the spars of the main wing. The outer bay, which is the nose of the wing, has an oblong, while the nose tip, which is really a 220 gal. wing tank, is in of a positive chord of 3 ft. The center of the lower wing, which supports the landing gear when folded, is cut with a negative chord of 8½ deg. to reduce the length of the leading gear members. The auxiliary wing is set at a high positive chord, sacrificing the lateral stability of the plane. The main wing has a standard Bellanca surface of 80 sq. chord. It does not taper in either plan or thickness. The inner bay of the lower wing has a modified Clark Y section, though it is of much greater thickness, while the left strut is another Bellanca-Diabolo-shaped section. This strut is said to lift considerably more than its own weight, in fact, it is a weaker wing and its perceived area lifting approximately one third that of the nose area of the upper wing. The nose wing is rigid, with a 2 deg. angle of incidence, while the incidence of the auxiliary wing varies from 3 to 3 deg. increasing towards the upper wing. The reason for this is that as the gap between the

upper surfaces, the downwash increases, thus the incidence of incidence of the strut is the same.

In construction, the structure of the main wing follows standard practice, except that the spars are solid spars with no webbing. They are comparatively narrow and quite deep, the ribs are the same as those in other Bellanca planes, except that they are of larger chord. The cap strips are made out of a single flat piece ground to the middle to the web is glued and fastened to it to form the latter. The rear trailing, making up a Warren truss is made of two propeller shafts to each side of the web, balsa wood being glued in between to make them work as a column. The ribs are attached to the spars by triangular blocks on each side of the spar. The compression ribs are similar to the others, except that there are additional solid, rectangular sections, which measure as each side of the ribs between the spars. The tail bearing is completed by a set of Stewart Institution blocks. It is interesting to note that the ailerons extend the entire length of the outer bay and the covering of the upper wing.

## New Wing and Tank Combination

The outer bay of the upper wing, as has been mentioned previously of a 220 gal. wing tank back as far as the rear spar that is, the covering is of sheet aluminum with gusseted webs. The internal structure is of conventional metal tubing. The forward spar is of I section made up of a top chord with the angles on the back. It is lightened by a number of holes which allow for the gasoline to flow on the leading edge backward. The rear spar is also a front spar however. The last six in leading edge, as gasoline is carried in the trailing edge. Every second rib of Warren truss construction, while the others are solid with small holes at the top and bottom to permit the flow gasoline and yet prevent the gasoline from leaking out as in the other when the plane landed. The tank is built up with extended bulb type angles for support and mean bearing. The interior of this wing panel is low and well reinforced, while the outside is protected by rounded varnish. The internal structure is capable of withstanding high compressive loads caused by the weight of the oil and the aid of the metal covering, giving an additional safety factor besides holding the gasoline. This portion of the wing takes a 220 gal. pressure load, weighs 100 lb. and the axis is 64 ft. 10 in. the weight is 10 lb. per sq. ft. - 102 lb. per gal. It is claimed that this combination of wing and tank has never been made before, either in this country or in Europe. The apparent advantage of the wing tank panel lies in the fact that it weighs less than the con-

tional weight of the auxiliary wing and tank built separately and in the further fact that the wing is stronger. The outer panel of the wing is pin pointed to the wing tank and supported by an X strut between the upper and lower wings. Weight of upper panel is 11 lb. per sq. ft. of area.

The inner bay of the lower wing houses the landing gear. It is of extremely heavy construction to provide the strength



Picture of full cantilever landing gear showing fairing for shock absorber and retraction rod.

and the full cantilever mount for the wheel at the outer end of the panel. Plywood is used to cover that portion of the wing, which employs heavy rectangular spars, webs and wood ribs for the internal structure. There is a large circular opening in the lower surface to provide for the retraction of the landing wheel. This portion of the wing, because of the cantilever construction, tapers in both plan and thickness. It has an 8 ft. 6 in. chord at the root and a 70 in. chord at the intermediate point. This chord at 12 in. is the same as that of the rest of the auxiliary wing or left strut.

The landing gear is housed to the outer end of the lower wing panel. The wheel is mounted almost under the forward spar so that the X type aerofoil strut carry most of the landing load. The forward member of this X strut, over the wheel, is of unusual stiff tubing like the other struts, how-

Continued on page 374



Front view of the Bellanca Sesquiplane Model K, powered with a Pratt & Whitney "Hornet" engine.

# Fuselage Analysis

Stress Analysis of Commercial Aircraft, Chapter Number Thirteen

By PROFESSOR ALEXANDER KLEWIN

Seated Superintendent of Aerodynamics

And GEORGE F. TITTERTON

Editor of the Bureau of Aircraft, Very Experimental

In THIS chapter the fuselage will be analyzed for the high resistance and low loading conditions. The method of analyzing for low resistance is similar to that for high resistance. The effect of negative torque will also be analyzed and the loads obtained added to those found at the high resistance analysis.

#### High Resistance Fuselage Analysis.

In this condition, the fuselage is subjected to the panel loads due to the weight of the skin supports, in the left and drag resistances of the wing as well as the wind load due to a frontal load on the nose of the fuselage, and a tail load applied at the rear end to maintain equilibrium. These loads must all be known and plotted in their correct locations on the fuselage trace before the graphical solution can begin.

The panel loads listed in the table in the previous chapter are panel loads due to the entire weight of the plane. We must now subtract their portion of the panel loads due to the wing weight and then multiply all the panel loads by the high resistance load factor. This has been done in the following table. Columns 1 and 2 were obtained directly from the table of panel loads. Column 3 is obtained by subtracting column 2 from 1. Column 4 shows the design high resistance panel loads, obtained by multiplying column 3 by 1.32/1.19 if the high resistance load factor but since we are solving only one side of the fuselage trace we use only half the loads.

#### Design Panel Loads—High & Low Incidence

Panel Point	Unit Load	Panel Weight	Design Panel Loads—High & Low Incidence		
			Low	High	Low
1	(1)	(2)	(3) = (1) + (2)	(4) = (3) X 1.32/1.19	(5) = (4) X 1.32/1.19
			(1) = 15	(4) = 45.0	(5) = 48.0
	Panels	Unit	Load	Design	Design
	Leads	Wing	Wing	Panel	Panel
11'	15	35	52		
11	23.4	23.4	41		
10	28	28	208		
25	45.6	45.6	157		
1	142.5	142.5	901		
4	456.7	179	272.5	476	
5	590	590	3400		
6	479	170	301	3446	
7	354	164	216		
8	16	16	21		
9	5	5	12		
10	8	8	20		
11	8	8	17		
22	8	8	17		
23	8	8	17		
23'	8	8	17		
23L	14.7	14.7	52		

Continued on page 3715

# The Kinner "Courier"

A Folding Wing, Parasol Type Monoplane Powered with a 100 Hp. Kinner Engine and Having a Top Speed of 120 M.P.H.

A NEW folding wing monoplane has been completed and test flown by the Kinner Airplane & Motor Corp., Glendale, Calif. Available in either two or three place open or closed models, the plane was designed by W. B. Kinner, aeronautical engineer closely known for the design of the former K-5 engine now in quantity production, and is the latest Kinner three place biplane, now being some-

Although this and several other features of the plane are quite unique, they have not been attained by mere modification. Powered with a 100 hp. Kinner in cooled metal engine the Courier has shown the same remarkable flying qualities that are characteristic of the light three place Kinner Allis biplanes. Test flown by W. B. Kinner, the new plane proved its ability to get off the ground loaded with a man of 160 lb., flew at a top speed of 120 m.p.h., landed at 35 m.p.h.,



Front quarter view of the "Courier" powered with a 100 hp. Kinner engine.



Received under exclusive rights by the Crown Motor Carriage Works, San Angelo, Calif.

The Courier is a parasol type monoplane with a tapered nose. A distinctive feature is the short chord of the wing at the center section, both wings tapering in sharply at the point of attachment. This results in excellent visibility for the pilot as his view is practically unobstructed in any direction and in a glide he can see the landing field at 60° to 70°.

The wings are very nearly horizontal at their folding points. One man alone can fold both wings in 10 sec. with the front wing pins are pulled, the front struts released and the leading edge of the wing drops toward the



Rear view drawing of the Kinner "Courier".

and using swiveling wheel landing skid brought to a stop within a run of less than 160 ft. after landing.

The Courier fuselage is of standard welded steel tube construction with overwing engine mount. The passenger's car compartment has the left side cut away for a door close down to the housekeeping. The cockpit is of the rapid adjustable type.

The wing is of standard wood construction, tapering to the tips and sloping sharply to the small center section. The average chord is six feet, wing span is 25 ft. and wing area 218 sq. ft. The wing is supported by the fuselage at the center section by double truss structure reaching from the base and under its own power if necessary to a safe point at 45° to the

Continued on page 3711

ground while the wing remains supported by the braced rear struts. From this position the wings are readily pushed back along a fuselage slot hooked in place ready to push the plane up a garage 8 ft by 16 by 22 ft. or to drive it along the base road under its own power if necessary to a safe point at 45° to the

# The "Wasp" Series "B" Engine

By GEORGE J. MEAD

T. F. PRUITT, Pratt & Whitney Co.

ON FEB. 18, 1938, the new Series "B" "Wasp" completed its official Navy 50 hr test with outstanding success. For Naval purposes the Series "B" "Wasp" is rated at 450 hp. at 2300 r.p.m., as compared to the rating on the older Series "A" of 410 hp. at 1900.

The engine was operated throughout the period developing substantially more than its rated power, or about 480 hp. There were no delays due to mechanical difficulties or otherwise, and upon completion of the test and take down the Navy inspector certified that the engine in all details was in perfect condition. Most striking of all however, is the fact that upon conclusion of the standard 50 hr. test the same engine was then operated successfully for another 20 hours developing 500 hp. at 2300 r.p.m. This same later flight marked the initial power record of the "Wasp" to develop the first of each type of engine to a severe overload test. Again, upon take-down, the engine was found to be in excellent condition.

During 1937 about 200 Series A "Wasp" engines were delivered to the Navy Department, and approximately 50 for



A Fokker "C-10" powered with a "Wasp" flying over the water.

mail and passenger planes. In Naval service "Wasp" engines are used in the single seat fighters, two seat observation, and seaplane types. In commercial service "Wasp" engines are installed in some 90 different types of planes ranging from the cabin type four seater to the giant tri-engine air transports. Boeing Air Transport alone has operated 25 Series A "Wasp" engines almost a million and a half miles in its transcontinental mail planes. In other commercial work,



Front quarter view of the "Wasp" Series "B" 450 hp. engine.

and including Naval and Army service, millions of miles have been flown by Series A "Wasp" engines under almost all conditions of temperature, service, etc. Pratt & Whitney engineers have closely followed their product in service, and their unique experience has furthered the development of the engine. After the initial months of all engine experience of its predecessor, the Series B is the refined model thus made possible.

The primary modification in the "Wasp" Series B is a provide for a higher r.p.m. and a correspondingly higher power rating for Naval and military purposes. The usual high speed of the Series B engine is 2300, as compared to 1900 in the older series. Discovered horsepower is correspondingly increased from 410 to 450. A year of experimental testing was employed to develop the adjustable modifications, together with service experience.

#### Crankshaft Diameter Increased 3/16 in.

The crankshaft pin has been increased 3/16 in. in diameter, permitting of increased strength in the shaft, but possibly to provide greater bearing wear in the crankcase housing.

An entirely modified cylinder is employed on the Series B which provides an improved, for better cooling, and stronger cylinder assembly. The connecting rod on the short cylinder barrel has been increased in diameter from 18 to 20, and see sketch thereto in section. The connecting rod is of a heavier type, and provided with hardened cap insert. An improved arrangement has been perfected for sealing up the compression covers over the valve seats. Material in the exhaust valves has been changed providing for greater strength, particularly when the valve is operating at high temperature.

The general design of the piston conforms to the type used in the Series A. However, the Series B piston is larger and stronger, and are now made from a permanent oil cold. The standard ratio for the Master piston for the normal

engine reduction distributor has been changed from 5-1 to 7-1, and the mounting is of the full floating type, and provides a stopping means to successfully take care of the gas, or atmosphere, and distribution of the engine. With the standard setting of the reduction gear, a 7-1 master ratio, there is no appreciable effect on the standard engine. However, the engine modifications calculated provide for ratings considerably higher than 7-8, through which a reasonable amount of supercharging can be obtained.

On account of great number of smaller modifications have been incorporated in the new engine, all of which are intended to assist in weight reduction, as well as to provide adequate for the higher power rating. While certain parts are not interchangeable between the Series A and B engines, the engines are entirely interchangeable as to installation in the airplane. The installation parts are identical, so there is no difficulty in replacing one type with the other.

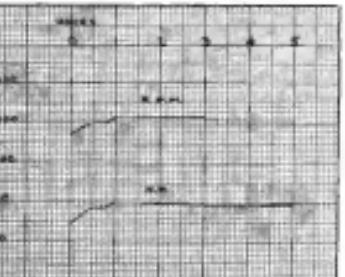
#### Flight Tests Give Final Proof

Both air and ground for various new types of powerplants, both air cooled and water cooled, left Farnborough, England, to have evaluated both in the all around merits of the single row air cooled radial "Wasp". The final proof of all theoretical assumptions in regard to engine types must come from the results of flight tests. It is generally admitted that because of its comparatively lower weight per horsepower that the single row radial offers the best opportunity for performance in climb and at altitude. It is freely stated that high speed is impossible with the single row air cooled radial type. Let us consider these statements in the light of proven facts.

Official Navy type test records credit the Curtiss "Hawk" pursuit plane with high speeds within one mph. at each after war fitted with either the water cooled 400 hp. Vee or air cooled radial "Wasp". These two engines are selected as types because their power rating is substantially the same—general proof of the correctness of the above report may be seen by reference to the National Air Races at Cleveland last fall. In the "Free for All" May 1937 race, the Curtiss Hawk equipped with a "Wasp" and driven by Captain Robert Ross, is credited with an average speed of 381.000 mph. in racing along with all the Army P-12's which in the Block averaged with the water cooled 400 hp. Vee whose high speeds were slightly less. This is certainly proof that at equal power the single row air cooled radial can attain more than equal the high speed of the water cooled Vee.

A recent descriptive credits the Curtiss "Pilgrim"—a standard two place observation plane—with a high speed of 188 mph when equipped with 400 hp. air cooled two-row radial, and further indicates that this approximates the high speed of the water cooled Vee engine of equal power when

fitted in the same type of plane. The Vought "Corsair" is also a standard two place observation type. It was initially designed about the air cooled "Wasp", and takes full advantage of the lighter weight characteristics of the single row radial. Recently a mock Corsair with a Series D "Wasp" engine flying as a seaplane, with Lord S. W. Cathay, E.S.A., as pilot, carrying an observer, its Naval fighter load, and with even



Curves for "Wasp" Series "B," Feb. 24 and 25.

the landing lights in position, was officially tried over the Navy straightaway course at Anacostia, D.C., at 100-3 mph. It is pointed out that in the above test the Farnborough with the 400 hp. air cooled engine was flying as a high land plane. It is of further interest for comparison that the landing speed of the Corsair is approximately 80 mph., as compared to 90 mph. for the Farnborough with equipped with the 400 hp. air cooled or water cooled powerplants. The Corsair which was used in the above indicated high speed trials was delivered only thirty days previously. The plane and engine had less than three hours flying before being sent over the speed track. It must be taken into account that the Corsair is designed both for the strain of catapult as well as the arresting gear as the aircraft carrier, for both of which is required an exceptionally sturdy plane. In view of the above comparisons, it seems hard to conclude that the single row radial has handicapped the high speed characteristics of the Corsair, much as we believe that the Corsair is an excellent design.

Continued on page 1703



The Fokker F-10 mail and passenger plane powered with three Pratt & Whitney "Wasp" engines.

# The Problem of Aviation Insurance

By HENRY H. BALOS

**I**N EVERY properly-run business the ordinary and extraordinary risks are covered by insurance. When a finance company lends money on an automobile, the risk is usually covered by insurance in case of fire, theft, and perhaps on other risks. The passenger bus and the trucking companies possess insurance both against damage loss and liability by taking out insurance. A plane may start aircraft and their operators, however, think their cost is covered by insurance by a system of "air time." This system, however, is not always sound. It is a management team that a considerable number of operators and manufacturers who, by the tooth-pick method, say, would prevent every case of accidentedness with insurance policies at any sum, will in the aggregation industry take a blind plunge and still think themselves good-financiers and sound men of business. Just one crash, with its consequent lawsuits on various kinds of liability, might easily bankrupt even a large operator. Of course the crash may never come. On the other hand it is just as well to remember that last year there were 814 per cent. of fatalities among the licensed airplanes.

## Aeronautics Needs Capital

The banks and other financing institutions know all of this and refuse to lend money to an unmeasured aviation project just as they refuse to lend money on an unmeasured real estate project. But the man who puts his own money into an aeronautical manufacturer, operation, or service often thinks he is safer than the banker. He is, but the banker should be lenient on the risks, if it is not only his own but also the bank's. In general, the aeronautical industry is subject to numerous public inquiries and asking off capital. As everyone in the industry knows, aviation today needs money—lots of it, and right away. Adequate insurance, covering all risks of an air service, part, or factory, will result in attracting the required capital by proving that commercial aviation is as safe and safe as a business proposition can be. Because of the seasonal nature and size of aviation risks, insurance is immensely more important than on other lines of commerce, and only by means of intelligent and adequate insurance can the industry achieve the degree of financial stability upon which a progressive business policy can be built.

At the beginning of 1938 there were 19 states (Belawere, Idaho, Michigan, Nevada, North Dakota, South Dakota, Pennsylvania, Tennessee, Utah, and Vermont) besides Hawaii, which required all planes to carry insurance covering property damage and personal liability at least. In a number of other states there has been a great deal of talk about similar legislation, and there can be no doubt that shortly aviation insurance will be mandatory more generally.

The outstanding risks met with in aviation are accidents in personal, property in material and equipment, such contingent risks as public liability and property damage, and passenger and cargo risks. Insurance coverage for all risks

is now available to a gross amount of over \$750,000 per annum, and effective for either a short or a long period. The expense of such insurance is almost negligible, so standard auto liability insurance, although there are a large number of variable factors which under adverse conditions can lower the insurance cost, is the best buy. For instance, the premium rate on a war-surplus flying boat would naturally be higher than the rate on a 1929 model tri-motorized transport, and the rate on a gross insurance plan would be higher than the rate on the same plane used only on a lighted airway. By the same token, rating or exhibition use will raise the rate, while undivided usage or passenger transportation will keep the rate low.

An important factor in fixing the rate is the experience and claim record of the pilot. A man who has had an unusual number of accidents would not be considered a good risk, while a man with a long and clean record would bring the insurance premium down. On the ground and the airfield proper keepers keep the risk down, while the insurance service, the extinguisher houses, the hangars, and the planes, and a strict adherence to an open class or higher are required. The chief risk with of Federal and State regulators is, of course, also required. In short, the attitude of the insurance companies is to charge as small a premium as is compatible with the risk, and to give as much credit as possible for safety factors, holding any aspect of the risk.

## Not Booked by Any Claims

For the coverage with facilities for repair, an easy and automatic way of reducing the insurance premium is to have the "deductible," or maximum amount at which the insurance company begins to be liable for compensation to the policy-holder. In most cases damage amounting to less than 16 per cent. is not payable by the insurance company, although the formula, epidemic and widespread deductible amounts is 5 per cent., and the theft, robbery, and pilferage deductible is 10 per cent. Thus the insurance company is relieved of a tremendous burden of petty claims, and is able to keep rates lower than would otherwise be possible.

The operator who wishes rates lower than the standard can secure them by adding the deductible at, say, 28 per cent., taking upon himself the expense of making repairs at his cost within the deductible. For the operator with an adequate general insurance this method has proved successful in reducing his total charge for insurance premiums without greatly increasing his payroll and materials expenses.

Another form of insurance is called "self-insurance" or "no-insurance," whereby the owner fixes the amount of insurance at some percentage of the estimated value of the risk, and the insurance company is liable only to that percentage. For instance, a plane valued at \$30,000 at the time of application is insured in the principal amount of

Continued on page 2709

# The Boeing B-1D Flying Boat

New Boeing Design is a Three Passenger, Closed Cabin Boat Powered with a Wright "Whirlwind" Engine

**T**HE BOEING Airplane Co., Seattle, Wash., has made up the Boeing B-1D Flying Boat, a three-passenger closed cabin boat, and will carry the design across the ocean this month, at Yorkton, B. C., for the first flight. It will be noted that the B-1D was a two bay pusher biplane with the engine mounted between the wings behind the cockpit. The new design of the B-1B has been modernized and consists of a single bay structure. The wooden hull has been strengthened and the three passengers and pilot are carried in a glass enclosed cabin. The Hall-Siddell L-2 200 hp water cooled engine has been replaced by a Wright Whirlwind. The new engine is also mounted with a pusher propeller and is enclosed in a streamlined nacelle between the wings. The B-1D weighs 2042 lb. empty and will carry a maximum load of 1600 lb., making the total weight 3642 lb. At the place of the same design, has had a Pratt & Whitney "Wasp" engine installed and the first of this type is now in test aircraft on a demonstration tour in conjunction with Pratt & Whitney Aircraft Co., Hartford, Conn. The new engine model has been named the "Flammeagle," it seats five people and a correspondingly greater useful load.

In redesigning the wings, the nacelle has been replaced by Boeing 16A serials, a moderately thick section. The wing structure is almost identical to that of the Boeing 9A, most parts used are the Chicago-San Francisco trans continental and route. The structure is as simple as possible, using sheet metal and wire construction covered with fabric. The wings are set in at 20° to the horizontal and the upper wings are of the cantilever type, they are connected with a struts and the both wings are of the same span, the rigging in very simple. The cantilever construction consists of solid spruce spars riveted in at 8 sections for lightness. The tail unit is of frame design with spruce cap strips and cross members reinforced by



Close-up view of the "Flammeagle" powered with a "Wasp" engine. The plane is now making a demonstration tour of South America.

pinched gussets at the joints. The leading edge of both wings is covered with plywood to preserve the proper contour of the nacelle. As there is no center section, the wing is built in four panels, two upper and two lower. The inner struts and interplane struts are of round steel tubing faced with hoods or sprays to give a streamlined section. The wings are tensioned fore and aft, and for left and landing, by streamline tie-rods in the usual manner. The outer interplane struts are omitted, while the inboard struts from the sides of the hull converge to a point where the upper wing panels are attached. The forward point supporting the fuselage is secured with lightening.

Continued on page 2712



Front quarter view of the Boeing B-1D powered with a Wright "Whirlwind" engine.

## Bourdon Company's "Kitty Hawk" Biplane Is a Three Seater Using Ryan Siemens

"KITTY HAWK," at the name of a new open cockpit biplane recently produced by the Bourdon Aircraft Corp., Philadelphia.

The plane, which is the first new production designed to be completed in New England, is equipped with seven cylinder Ryan "Siemens" engine and is planned to sell for \$4,000. It is a three place biplane with enclosed steel tube fuselage and wooden wings covered with fabric. According to the manufacturer, it has a high speed of over 100 mph and a landing speed of 35 mph, carrying a full load of 35 gal gasoline and three people, or 1000 lb gross



New "Kitty Hawk" three place biplane

weight.

The plane is named for the famous site of the Wright brothers' first flight and the slogan of the company is "Flies like a hawk and lands like a cat."

The first Kitty Hawk biplane was recently flown from the factory to Boston Airport and inspected there by William P. MacCracken, Assistant Secretary of Commerce for Aviation. It was flown in tests by Massachusetts Aviation Engineers, Robert L. Davis, and his co-workers, Franklin T. Hart. It is now being flown to Worcester, Springfield, Hartford and New York for demonstration.

## Wright Engines Rights Granted to Three Foreign Companies and One Government

ANNOUNCEMENT HAS been made by Charles L. Lawrence, president of the Wright Aeronautical Corp., that contracts have been signed granting to foreign interests the right to manufacture and sell Wright Whirlwind engines. Several flights made with the Whirlwind have established the reliability of the American engine, and now these large foreign corporations and one foreign government have been granted rights.

The government to which rights have been granted is that of Poland, with the companies whose have obtained manufacturing and sales rights are the Shida, Ltd., of Pilzen, Czechoslovakia; the Societe Francaise Hispano-Suiza of Paris, France; and the Canadian Wright, Ltd., of Montreal, Canada. A large part of Central Europe, the Balkans, and Finland will be supplied by the Shida company, while the demands of Norway, Denmark, Sweden, France, Spain, Holland, Portugal, Greece, Belgium, Switzerland, Turkey, and various colonies and dependencies will be met by the Societe Francaise Hispano-Suiza.

The Canadian company, on the other hand, was especially granted for the manufacture of Wright engines for the Canadian, Norwegian, and Australian markets. Members of the board of directors of this concern are prominent in Canadian financial and industrial circles. Among them are

Jesse Richardson, owner of Western Canada Airways; Paul Platkin, owner of the Palms Airway, George Rice, managing director of Canadian Vickers; Frank Rose, Montreal steel dealer and rail operator, and J. Arthur McIlroy, his son, insurance man.

In the West Indies, Mexico, Central and South America will be supplied by the expanded Wright Aeronautical Corp. of Venezuela, N. J.

Prior to the granting of these foreign licenses, Wright "Whirlwind" engines were sold direct by the Wright company in England, France, Germany, Holland, Russia, Italy, Yugoslavia, Poland, Czechoslovakia, Japan, Austria, Greece, Argentina, Costa Rica, Honduras, Colombia, Brazil, Paraguay, and Porto Rico.

## Galt Joint Union High School in California Offers a Complete Four Year Aero Course

GALT JOINT UNION HIGH SCHOOL at Galt, Calif., in Sacramento Valley, has opened a four year aeronautical course beginning the present year of high school work and ending at the completion of the sophomore year in college. The course is especially arranged to prepare young men for the Army and Navy cadet schools and for high engineering schools. All work, including 50 hr of dual instruction given gratis. This work will also post-graduate students limited to a selected group of students according to previous, physical fitness, character, etc.

The Galt school has arranged special interest during the past two years to the State high schools to introduce flying and aeronautical studies in each a course. During the past year gifts from the Government and other sources an accumulation of \$100,000 in value, under contract were turned over to the school. Owing to the demand, a junior college course has been established in addition to the high school work, the office work being conducted by the University of California. The school has three flying fields.

The subject matter of the course is outlined as follows:

**First Year:**  
"Modern Aircraft" by Page  
"Strength of Materials and Plane Design; Test used; Elementary Aeronautical Science" by J. B. Hart and W. Hart  
"General Science" by Snyder  
"Aeronautics" by Page

"Modern Aerodynamics" by Page  
"Elementary Principles of Aeroplane Design and Construction" by A. W. Judge  
Mechanical Drawing as Plane Designs

**Third Year:**  
"Aeroplane Design" by Warren  
"Physical Geography" by Parr and Von Engeln  
"Engine Construction and Operation"  
"Aeronautical Engineers in Theory and Practice" by J. B. Hartman

**Fourth Year:**  
"Aerial Navigation" by Capt. Lewis A. Yancey  
"Aeronautical Meteorology" by W. R. Coop  
"Principles of Flight including the following subjects:  
Study of U. S. Air Commerce Regulations

One semester work with study and use of Navigation Instruments.

During the fourth year there will be given a pilot's certificate, covering the American Aeronautics and British certificate.

Further information may be obtained by addressing the aeronautical department of the school.

## Eleventh Annual Baltimore Aero Show Held At Logan Field is Biggest in City Annals

UNDER THE auspices of the Baltimore Aero Club and the Maryland National Guard Air Corps, the Eleventh Annual Baltimore Aero Show was held at Logan Field on Memorial Day. It was by far the largest airplane show held in Baltimore, and was a military event, although there was a great many visiting commercial and private planes on the field. This was the 10th year that new machines technically participated.

The show went from North private planes, two Curtiss, four Goliath, one Stinson plane, and a Ford monoplane. The Marine Corps took six Hawks, and those used by the Army included Pabion pursuit planes, Hawks, and bombing craft from Bolling, Langley, and Phillips Fields. Also, the squadrons of the National Guards of Pennsylvania, New York, Connecticut, and Massachusetts were down to Logan Field and participated in the events.

Mac Sykes, Swiss, commandant of the Air Corps of the Pennsylvania National Guard, was the main feature of the



Mac Sykes, commandant of P.N.G. Air Corps, winning the National Guard Race in a Curtiss Falcon.

day, the National Guard Race. He completed the three-and-a-half mile course with a Falcon in 16 min. 26 sec. Last Legion Trotter of the Maryland National Guard was second in 16 min. 8 sec., while Louis Earl W. Fleet of the Connecticut National Guard was third in 16 min. and 12 sec. Louis L. H. Sanderson of the Marine Corps finished the race course with a Hawk plane in 14 min. 30 sec. Capt. W. G. Rogers, also of the Marines, came in five seconds later and Maj. Charles A. Lutz, winner of the Curtis Trophy race up to Washington, was third, one second behind. Each received an award.

Miles, Callaway, and Tolson Win Relay

A relay race in three types of planes was won by a team composed of Lt. Col. C. G. Miles, Lt. Col. S. W. Callaway, and Lt. Col. Cmdr. Tolson, all of the Marine Legion, Callaway, holder of three world speed records, flew a Wright Corsair.

A special race in which Lt. Col. Cmdr. D. G. Watson and Lieutenant Callaway won certificates was won against Maj. W. H. D. Eggers, commanding officer of the Air Corps of the Maryland National Guard and Capt. Charles A. Mason, racing Falcon in a 28 sec. race. The team was: Lt. Col. Callaway, 15 sec.; Lt. Col. Watson, 17 sec.; Lieutenant Commander Tolson, 18 sec.

one; Major Tipton, 25 sec.; 30 sec.; and Captain Mason, 30 sec.

Maj. Temple N. Joyce of the Chasse Voight Airplane Co. of New York, and Capt. Edward G. Black of the Third Corps Air were judges.

This year no experiment was tried. Major Tipton believed that the public now knew the difference between a preprint and a real and let them judge the winner of the mass meeting contest by aviation. Lead speakers were set up at strategic places over the field to announce the winners to the crowd of more than 50,000.

## Two Fairchild Monoplanes to be Operated On First Mexican Contract Air Mail Route

MEXICO'S FIRST air mail contract has just been awarded to the Compania Mexicana de Aviacion de Tampico, Mex., a subsidiary of the Fairchild Aviation Corp. of New York, George Held, president of the company, announced. The planes to be used on the service will be two Fairchild "All Purpose" Cuban Monoplanes.

The route, to be operated as a daily schedule, lies between Mexico City and Tampico via Tepic, a distance of approximately 500 mi. over mountainous terrain. The landing field at Mexico City has an elevation of 7,200 ft., the mountains to be crossed on the route are over 10,000 ft. high.

First class mail will be carried for 175 centavos per pound, and second class for 100 centavos per pound, and for 250 centavos per package. All mail to be sent on this route will be clearly marked "Correos Aereos," passing Avion Simplex, to be colored in green, white and red, the Mexican national colors. The wings correspond with the U. S. Air Mail arrow in red, white, and blue.

## Postmaster General Announces New Air Mail Rate Will go Into Effect August 1

AUGUST 1 has been named as the date on which the new air mail postage rate will become effective, according to an announcement by the Postmaster General. On and after that date, Air mail will be charged for the first ounce of the mail and 10 cents for each additional ounce. The Postmaster General has ordered a new fare card and mail stamp for this rate, which will be available on August 1.

The Postmaster General is asking wider authority given him by the terms of the Kelly Bill passed at the recent session of Congress and signed by President Coolidge providing for a reduction in letters and packages mailed on the air mail route. It has been variously estimated that through this rate reduction the business of the air mail will increase from 300 to 300 per cent.

## Hobie Airways Co. is Organized to Open Aeronautical School at Aberdeen, Wash.

ORGANIZATION OF a second flying school at Aberdeen, Wash., has just been announced. It is to be known as the Hobie Airways Co. and will be operated by the Hobie brothers, former operators of the Hobie Timber Co. The new concern has arranged for two planes from Clover Field, Calif., to handle instruction of pupils.

Capt. R. E. Kennedy and E. C. McLeod will act as instructors for the new school. Both are members of the 32nd Pursuit Squadron. Captain Kennedy was also an instructor at Kelly Field, Tex., during the World War. The other flying school at Aberdeen is the Gray Harbor School of Aviation.

**Rolls-Royce, Ltd., London, Now Producing  
The F 11 and F 12 Water Cooled Engines**

**ROLLS-ROYCE, LTD.**, London, as now is production of the Rolls-Royce F 11 and F 12 water cooled engines which were recently approved by the British Air Ministry after an official 100 hr. test. Both the F 11 and F 12 use general drive engines of essentially the same construction differing only in gear ratio. The rated power is 400 hp., though the engines have developed 500 hp. They differ radically from the Rolls-Royce engines produced in the past, there are 12 cylinders instead of 10, the engine is built in two sections, the crank block is a single unit containing all of the cylinders rather than have each cylinder separate. The cylinder blocks are aluminum alloy castings with steel liners for the cylinders. Cylinder heads are integral with the blocks and have two intake and two exhaust ports per cylinder. The valves are driven by a single cam shaft over each bank. These cam shafts are actuated by a system of lever gears connected in the vertical shaft driven by the accessory drive at the rear. Machined aluminum alloy forgings are used for the pistons. They have a bore of five inches and, since the stroke is five



**Rolls-Royce F 12 engine, a 12 cylinder water cooled power plant rated at 400 hp. Note the radiators gear at the forward end**

and one half inches, the engine displacement is 3,300 cu. in. Three compression rings and one oil scraper ring is used in each piston. The connecting rods are made of forged steel and feature both the upper end of the plain type fitted with a bearing flange and the lower end of the plain type fitted with a bearing flange having bearing bushes. The lower end of the lower end of the forged type has the bearing bush with white metal. Each end is provided with an oil valve which receives oil from the forged end to the plain end.

The crankcase is two aluminum alloy castings joined slightly below the level of the crankshaft. The main crankshaft bearings are divided cold steel shells lined with white metal. These bearings are held in the upper part of the crankcase by forged aluminum bearing caps bolted in place. In addition to the upper mounted bolts, each is braced by two horizontal bolts which fit the two sides of the upper crankcase casting together. The crankshaft is a nickel steel forging machined all over. It is carried in seven bearings as it turns three. The crank case and journals are all bored for lubrication as well as to carry the lubricating oil. Bolts and nuts at the front end of the crankshaft engage similar splines or the pinion of the single stage reduction gear.

The F 11 has a gear ratio of .632 while that of the F 12 is .583. At the rated maximum speed of the engine, when developing 400 hp., is 2,250 rpm., the F 11 will have a top speed of 100 mph. and the F 12 104 mph. The maximum output of both of the engines, 500 hp., is at 2,500 rpm. The engine weight of the F 11 is 400 lb. and of the F 12 450 lb.

**British Blackburn Napier Ropon II Bomber  
And Torpedo Plane Successfully Tested**

**WORD WAS** recently received from England of the successful tests of the Blackburn Napier Ropon II, a propeller carrier capable of carrying a torpedo weighing 1,600 lb., or a similar load of bombs. It is a conventional open cockpit biplane powered with a Napier Lion engine. There are two engines in tandem, the forward one being tried for the pilot and the rear one for the gunner or bombardier. An air plane



**England's new biplane and bomb carrier, the Blackburn Ropon II. It is reported that successful tests have recently been made with this new plane.**

on the British Air Ministry's secret list, details or its performance cannot be given out. It is said to have a speed of over 120 m.p.h. with a slow landing speed and quick take off.

**Stout Air Services, Detroit, Inaugurates**

**Air-Hall Passenger System to Ohio Points**

**STOUT AIR SERVICES, INC.** of Detroit recently inaugurated an air mail service whereby passengers over the company's Detroit-Cleveland airline may continue to various Ohio cities or to the Cleveland Airport. Arrangements for the new system was made with the Cleveland Southwestern Railroad Co.

In changing from planes to the railway at the airport, either at the Stout passenger point east, passengers will avoid the greatest portion of the rail route—the rail through Cincinnati, that is.

The Cleveland-Southeastern railway borders the airport on the outskirts of the city. Detroit passengers on the aerial line may purchase through tickets to the Ohio cities of Medina, Wooster, Ashtabula, Mansfield, Dayton, and all intermediate points. Tickets may be bought at Detroit, or at any point reached by the railway.

**Apache Air Lines of Phoenix, Ariz., Buys  
Mitsubishi Powered Brown-Mercury Plant**

**APACHE AIR LINES**, operating a daily passenger service between Phoenix and Prescott, Ariz., has opened the season with a successful flight and acceptance of a new Brown-Mercury monoplane. The initial flight was made with 10 passengers. Larry Brown, president of the Brown-Mercury Aircraft Corp. of Los Angeles, made delivery of the new plane in person. The new monoplane is powered with a 200 hp. Mitsubishi-Hispano engine. It is an open cockpit, 2-seat monoplane.

Brown is a pioneer, having entered aviation in 1923. With Leroy Beasley and Katherine Stinson, he founded an aerial race that toured the country in 1924.

**First Definite Steps on National Air Tolls  
Are Announced by Detroit Board Official**

**STILL REPORTS** being regularly received from the pathfinder plane, Capt. W. Bela, assistant manager of aeronautic events for the Detroit Board of Commerce, has announced the following other definite steps in the National Air Tolls for the Kalamazoo Ford Trophy which is to begin from the Grand Rapids June 28.

Indicates (July 20) Indianapolis will be a secondary stop on the initial leg way. G. M. Williams, president of the Marion Motor Car Co., is the Indianapolis sponsor. The plane will land on the speedway.

St. Louis

(July 20-21)

Arriving on St. Louis late in

the afternoon of the 20th, the aeronauts will remain in

the city until the morning of July 21. Maj. A. J. Landolt, chair

of the reception committee, who will hold the planes

will land, has promised an elaborate entertainment program,

including a general shooting of the Landolt trophy.

The St. Louis Chamber of Commerce is the sponsor.

Kirksfield

(July 21)

A secondary stop will be made in

Kirksfield while the planes are en route to Wichita. Tom Sawyer Bay Company has announced that no stops will be made in Springfield if the weather is bad. The Springfield Chamber of Commerce is the sponsor.

**Wichita, June 23**

Wichita

(July 23)

Arriving on the afternoon of July 23 the planes will remain until the following morning, at

which time they will take off for Tulsa. The Wichita Chamber of Commerce is sponsoring this visit.

Tulsa

(July 31)

Tulsa, at the head of the oil country,

will host to the tour planes from July 31, continuing on

in the morning of the 30th. J. P. Mitchell,

chairman of the Tulsa Chamber of

Commerce, sponsor of the stop-over, has announced that the city plans to dedicate an new \$1,000,000 municipal airport

the morning planes' arrival.

Fort Worth

(July 6-7)

In Fort Worth the planes will

remain from the afternoon of the 6th until the morning of

the 7th. This stay will be sponsored by the Ft. Worth Chamber of Commerce.

Waco

(July 12)

Waco will be a secondary stop while en

route to San Antonio. The stop will be sponsored by the Waco Chamber of Commerce.

**San Antonio, July 19**

San Antonio

(July 19)

In San Antonio the planes will

arrive at Wadsworth Field, the municipal airport, formerly known as Sherman Field. K. H. White, president of the San Antonio Chamber of Commerce, sponsor of the visit, has announced that Sherman Field will be run into San Antonio for the convenience of the planes. The planes will leave San Antonio on the morning of the 20th.

Hanford

(July 26)

A small outfit down on the

waters of Lake Tulloch, and, probably the smallest place

visited by the flying planes will be a one day stop.

El Paso

(July 16)

Landings in El Paso will be on the afternoon of the 16th,

the planes will remain over for the night.

The El Paso Chamber of Commerce is the sponsor.

Tucson

(July 18)

Tucson will be a secondary stop

between El Paso and Phoenix. Eddie T. Moore is in charge of aerial flights in Tucson.

Phoenix

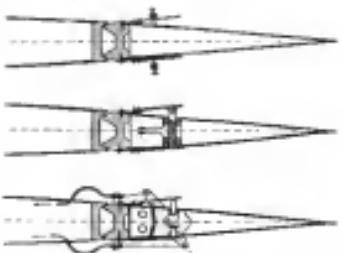
(July 19)

Phoenix is scheduled for a refueling

service between Tucson and San Diego. The stop is being sponsored by the Phoenix Chamber of Commerce.

**Balance Mechanism for Control Surfaces  
Developed by the Nieuport-Delage Company**

In a recent edition of the French publication, *L'Aeronautique* there appeared a description of a device developed by the Societe Anonyme Nieuport-Delage for the balance of control surfaces, especially the elevator. It consists of a pair of longed flaps on the upper and lower surfaces of the control near the leading edge. Normally the flap is flush with the surface and has no effect; however, should one be raised it will direct the air flow over the surface and cause an air force towards the side with the raised flap. The flaps may be adjustable either on the ground or in the air. A sketch



will be used on the ground while a servo mechanism, controlled from the cockpit, may be operated in the air. Another method suggested is to use a cam between the flap and have the flap held against the cam by springs. The Societe Anonyme Nieuport-Delage manufactures aircraft planes for the French government.

**Aero Conference, Airport Dedications, and Flying Contests are Scheduled at Boston**

**EVENTS ON** the Boston aviation calendar in the near future are: June 15, tenth anniversary of the Hyannis and Martha's Vineyard airports; June 21-22, New England Central Aviation Conference at Boston; June 23-25, Lowell Airport dedications and Exposition; June 25, Beverly Airport field meet.

The most important week-end of June 23 saw much activity with the dedication of the new Worcester Airport.

The second most important week-end of importance was the dedication of the Guggenheim Aerodynamics Laboratory at Massachusetts Institute of Technology on Monday, June 4.

**House Passes Bill Authorizing Commission  
To Name First Successful Flying Machine**

**A BILL** has passed the House of Representatives authorizing the President "to appoint a commission of five distinguished citizens of the United States to whom Orville Wright and all other persons in any other way interested, shall be publicly invited to present evidence as to what was the first successful heavier-than-air flying machine." The report is to be transmitted to Congress by Nov. 1, 1928.





## Italian Flyers Set New Endurance Record

OF 58 Hr. 37 Min. in a Savoia-Marchetti

MAJ. ANGELO FERRARI and Comte, P. del Porte, Italian flyers, landed at Monticello Field, Bronx, on June 2 after a flight of 86 hr. 37 min. duration in a Savoia-Marchetti S.84 monoplane. The world's endurance record is thus transferred to Italy, since the record of 83 hr. 36 min. 28 sec. established by Eddie Stinson and Capt. George Holloman on a Standard-Evansco on March 30 has been surpassed by five hours.

The Savoia-Marchetti plane is powered with a 12 cylinder Fiat water cooled engine developing 550 hp. The craft was



Comte P. del Porte and Maj. Angelo Ferrari, Italian flyers, who established a new world's endurance flight record.

designed by Alessandro Marchetti, a designer of planes since 1920. Marchetti is at present chief designing engineer for the Savoia company at Rome, Calabria, near Naples, which built the record breaking S.84.

Maj. Ferrario and Comandante del Porte took off at 5:35 A.M., Monday, June, 2, from Monticello Field and took over a course which lay on the vicinity of the sea coast. Their final point, the two flyers landed at 3:55 P.M. June 2 after the long two and one-half day flight. The French and Italian Aero Clubs officially rated the flight as accordance with international aeronautical regulations.

Majer Ferrario is a pilot of first, having flown from Rome to Tokyo in 1930. Comandante del Porte accompanied Maj. Ferrario on his long flight to the American continents last year.

## French Medal for the Best Work on Aero Engineering is Awarded Edward P. Warner

THE AERO Club of France has awarded its medal for the best technical work on aeronautical engineering appearing in 1935 to Edward P. Warner, Assistant Secretary of the Navy for Aviation, for his "Aircraft Design-Aerodynamics."

This book was published by the McGraw-Hill Book Co., New York, in August of 1935. It is considered authoritative on the part of aircraft engineers here and abroad. Reviews of this country, in England, in Germany, in France, and in Italy have said the book is almost at every college in the United States where aerodynamics is taught adopted the book as a text. In these months the first large printing was completely sold out and another printing was needed.

Secretary Warner is a member of the Society of Aeronautical Engineers, Associate Fellow of the Royal Aeronautical Society, and professor of Aeronautical Engineering at Massachusetts Institute of Technology. He was appointed Assistant Secretary of the Navy for Aviation in July 1935.

## Capt. Kepner is Credited With Longest Flight in National Elimination Balloon Race

CAPT. EDMUND KEPNER is considered to be *runner-up* to the National Elimination Balloon Race which began from Pitts Field, Pittsburgh, Pennsylvania, on Memorial Day, though official checking of instruments and distances is awaited before go to press. Captain Kepner and his mate, Louis W. O'Kearney, landed at Weston, Va., at 6:30 A.M. May 30 in the free balloon "Army No. 1," the third leg to set up as far as the group of 16 which took off from Pitts Field between 5:31 P.M. and 6:05 P.M. the afternoon before.

Only two other balloons were successful in leaving the start area which opened up to 100 miles in diameter on early in the vicinity of Pittsburgh. One of these, the "Tribute News," landed at 11:45 A.M. May 31 at Wilkes-Barre, Pa., while the "American Business Club of Akron," the other leg, came in at 1:15 P.M. at Connor Post Office, Ya., some 46 mi. east of Birmingham, on May 28. The Detroit News was piloted by William G. Taylor with Russell Shewell as co-pilot, while the American Business Club of Akron was commanded by C. A. Palmer with J. W. Mall as mate.

Three balloons crews are to be posted at the United States entries in the Gordon Bennett International Balloon scheduled to leave Ford Airport, Detroit, June 30.

Palmer and Taylor pilots which met trouble in the thunder storm are the "Wendover IV," W. E. Van Geffen, the "Gardiner II," R. H. Homayoff; the "Sun-Tite Pittsburgh," George W. Bennett, the "WPA," G. M. Lepage, the "City of Cleveland," Carl K. Wolcott; the "Detroit No. 2," E. J. Smith, the "Detroit No. 4," George Blasius; the "Army No. 2," Capt. Edward H. G. "George" Blasius; the "Army No. 3," Louis Paul Evert, the "Navy No. 1," Louis J. H. Stevens and the "Navy No. 3," Louis J. H. Stevens.

Major Palmer, pilot of the Army No. 2, and Walter Morton, able to Van Geffen or the Gardiner IV, were killed when their balloons met the full force of the storm. Van Geffen suffered a fractured left leg, while James T. Cooper, son of the City of Cleveland, was severely shocked and buried.

The Negro dirigible Los Angeles flew to Bettie Field from its Lakewood, N. J., station to attend the race. The dirigible returned to its base later without mishap.

## Mahoney Company Builds and Delivers Five Broughams in the Last Five Days of May

FIVE WHIRLWIND Broughams were manufactured and delivered during the last five days of May, according to an announcement from the Mahoney factory at San Diego, Calif., thereby breaking all monthly production records for that organization. During the 35 working days of May, a total of 30 Broughams were made and delivered, it is reported.

The five monoplanes turned out in the month closed with Capital Airways of Washington, D. C.; Charles Biggs, Tucson, Ariz.; the Tri-State Airlines of Sioux City, Iowa; Roy Bradford of New Castle, Penna.; and Midwest Airlines Services of San Antonio, Tex.

## Announce Recent Incorporation of Five New Aeronautical Companies in Nebraska

FIVE AVIATION companies have recently been incorporated in Nebraska, according to a report from Lincoln. The organizations are the Allstate Airways, Inc., Alliance, Neb.; McCord Aircraft Corp., McCord, Neb.; Missouri Valley Aerialways, Omaha; Central Airways, Inc., Omaha; and Pioneer Aircraft Co., Omaha.

## AVIATION offers another service to its readers

Books on aviation regardless of where published may be obtained through AVIATION's book department.

THE following books\* were chosen as an effort to compile a common list of the best of modern aeronautical publications:

### AERODYNAMICS

AERODYNAMICS AND AIRPLANE DESIGN  
By Edward P. Warner 1935

1935 \$10.00  
This is an up-to-date compilation of the latest research in aerodynamics and aircraft design. It includes the latest developments in aircraft and wind tunnel investigations, aerodynamics and aircraft design.

AEROPHYSICS FOR PILOTS  
By James E. Hansen 1935  
\$10.00  
This book is intended for the use of aviators, both military and civilian, in the study of the physical factors involved in flying.

AIRPLANE DESIGN CONSIDERATIONS  
By Edward P. Warner 1935  
\$10.00

This book is intended for the use of aviators, both military and civilian, in the study of the physical factors involved in flying.

AIRPLANE FLIGHT MECHANICS  
By Edward P. Warner 1935  
\$10.00

This book is intended for the use of aviators, both military and civilian, in the study of the physical factors involved in flying.

AMERICAN AIRPLANE DIRECTORY  
1936 \$10.00

This is the official directory of the aircraft industry in America. It lists the names and addresses of manufacturers, dealers, importers, and exporters of aircraft and aircraft accessories throughout the world.

AMERICAN AIRPLANE GUIDE  
1935 \$10.00

This is the official directory of the aircraft industry in America. It lists the names and addresses of manufacturers, dealers, importers, and exporters of aircraft and aircraft accessories throughout the world.

AMERICAN AIRPLANE INDEX  
1935 \$10.00

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AMERICAN AIRPLANE INDEX  
1936 \$10.00

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AMERICAN AIRPLANE INDEX  
1937 \$10.00

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AMERICAN AIRPLANE INDEX  
1938 \$10.00

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1939 \$10.00

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AMERICAN AIRPLANE INDEX  
1940 \$10.00

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AMERICAN AIRPLANE INDEX  
1941 \$10.00

This is the official directory of the aircraft industry in America. It lists the names and addresses of manufacturers, dealers, importers, and exporters of aircraft and aircraft accessories throughout the world.

AMERICAN AIRPLANE INDEX  
1942 \$10.00

This is the official directory of the aircraft industry in America. It lists the names and addresses of manufacturers, dealers, importers, and exporters of aircraft and aircraft accessories throughout the world.

AMERICAN AIRPLANE INDEX  
1943 \$10.00

This is the official directory of the aircraft industry in America. It lists the names and addresses of manufacturers, dealers, importers, and exporters of aircraft and aircraft accessories throughout the world.

AMERICAN AIRPLANE INDEX  
1944 \$10.00

This is the official directory of the aircraft industry in America. It lists the names and addresses of manufacturers, dealers, importers, and exporters of aircraft and aircraft accessories throughout the world.

AERONAUTICAL ALMANAC By Walter W. Scott 1935 \$10.00

This is an up-to-date compilation of tables and figures with the best of modern astronomical publications.

ALTIMETER AND BAROMETER  
By Edward P. Warner 1935

1935 \$10.00

This is an up-to-date compilation of the latest developments in altimeters and barometers.

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### Wilmer Stultz and Miss Earhart Ready For Atlantic Flight in Pontooned Fokker

**WILMER STULTZ**, Miss Amelia Earhart, and Louis Gordon are at Tropasney, N. Y., as Avenue goes to press, preparing for a flight across the Atlantic. On the morning of June 3, they took off Boston in their transoceanic Fokker monoplane "Friendship" and flew to Hadley, N. H., via Andover & Farnham, continuing to Tropasney where they are in residence to make out across the ocean.

Miss Earhart, who wished to be the first woman to cross the Atlantic by air, has been flying for several years. She



The Fokker monoplane "Friendship" taking off from a runway at Boston Harbor

is competing in late Model plane at the start. Louis Gordon, too, is ready to act as relief pilot, though he is accompanying Miss Earhart and Stultz in the capacity of mechanic. England has been indicated as the goal of the flight though it is said that a longer flight will be attempted if the fuel holds out.

The monoplane "Friendship" is the Whirlwind-powered craft which was originally intended as one of the eight of planes Commander Byrd was to take to the Antarctic. The plane, which is equipped with a 400-hp. engine, was built in Boston Harbor for several weeks to determine its adaptability to transoceanic flying capacity, lifting capacity, and speed. Two radio sets have been installed for use during the trans-Atlantic flight.

### Aeronautic Export Report for First Three

Months of 1928 Shows Increase Over 1927  
THE FOLLOWING report recently issued by the Bureau of Foreign and Domestic Commerce was prepared by Fletch W. Bartlett, Transportation Division, Dept. of Commerce:

The increased world demand for aircraft exports as reflected in the following report on American aircraft exports to foreign countries. These orders were received from widely diversified nations of the world including, for example, Peru, Canada, Japan, United Kingdom, Australia, and Cuba.

During the first three months of the current year, aircraft engines, parts and accessories were exported from the country at a valuation of \$915,486, approximately 250 per cent greater than the valuation for the first three months of last year, when all such products exported were valued at \$334,237. The percentage increase for aircraft alone, which includes both engines and accessories, was much greater than that of the total valuation of aeronautical products exported, there being an overall increase at \$959,416 reported during the first quarter of this year as compared with the units at \$84,276 during the same period of last year.

Peru was the principal market during the three months under review, when 18 units at a valuation of \$130,000 were sent to that country, whereas none were shipped there during the same three months of last year. Canada, the country of destination for one unit at a value of \$900, surpasses the

first quarter of 1927, which was most, obviously, have been of war surplus stock, was the destination for nine aircraft at a valuation of \$60,276 during the first three months of 1928. It is significant that the average valuation of the aircraft during the later period approaches \$33,000. Mexico was the third market for the three months under review, when it received four aircraft valued at \$99,729. Cuba, Brazil and Japan follow in order of their importance with four, three and two units, respectively.

The total value of aeronautical products exported during the first quarter of 1928 was \$1,000,000, compared with \$700,000 for the first three months of the previous year when \$63,339 worth were exported. Canada, however, remains important as an individual market with \$61,638 worth and was followed by Brazil, which was the country of destination for parts valued at \$32,853. Third, United Kingdom follows with \$34,163, and Japan next with \$35,647, indicating the diversity in markets. Russia, which was the leading market during the first quarter of 1927, was the fifth market in importance during the current period. Parts were the only aeronautical products shipped to non-contiguous territories. Fox to Rio received these valued at \$726 and Hawaii at \$2,075.

Canada, Argentina, and the Netherlands were the three leading markets in order of their importance for aircraft engines, the average unit valuation for all three countries being approximately \$1,000, which indicates that the engines have been of the same power rating. One engine valued at \$6,000 was exported to Belgium in connection with a license to Mexico at a valuation of \$400. The exact value of the exports were Canada \$10,069, Argentina \$10,069, and the Netherlands \$22,306. France, Sweden, and Germany were the next three largest engine markets. It is to be noted that there were over 200 times as much revenue from foreign business in aeronautical engines during the current period than during the same months in 1927.

### Belgians Establish 60 Hr. 7 Min. Duration Record by Refueling Plane During Flight

BY REFUELING while aloft, Adjutant Crozy and Sergeant Grelaud, Belgians, completed a duration flight of 60 hr 7 min 32 sec on June 4 flying over a route between Brussels and Diega. This shows original fuel supply of approximately 1,720 gal was four times replenished during the flight through a rubber tube of about 50 ft. in length, the fuel being delivered from a plane which flew above that of Crozy and Grelaud. Refueling was accomplished each time in about one minute while the plane flew at a 1,200 ft. to 1,300 ft. altitude.

The Belgians took off at 6:49 A.M. June 2 from Tullusmet Airport near Brussels, landing again at this field at 6:47 P.M. June 4. Reports have not been obtained, as yet, to prove, the type of plane and engine used in the flight.

### Johnson Flies Englewood to First Place In the Twin Cities-Crookston Air Derby

AN ENGLEWOOD pilot, "Thunderbolts" Johnson, will find place in the Twin Cities-Crookston Air Derby held on the third day of the National Aeroplane Show at the World-Championship Field, Minneapolis, June 10-12. Johnson, a local boy, is Jack Anderson, chief pilot of the Minnesota Air Craft Co., as Englewood, placed third in the derby. The race was started at the St. Paul Municipal Airport by Maj. H. S. Miller commanding officer of the 189th Aero Squadron, Minnesota National Guard, short stops being made at Minneapolis and Little Falls, the home town of Col. Charles L. Lindbergh.

### ANOTHER TRIUMPH FOR B. G. SPARK PLUGS



The Beauharnais Gouze taking off at O竹jeton, Calif.

## On the Kingsford-Smith Flight

CAPT. KINGSFORD-SMITH attributed a great part of the success of his trans-Pacific flight to "100% preparation". Only materials of first quality and known reputation were used in his plane. Spark plugs were an item where great care was taken. Kingsford-Smith chose B. G. Mica Hornet Spark Plugs for the job. That his choice was wise is now known by all.

Other recent flights on which B. G. plugs have proven their reliability are the Curtiss Marine Trophy Race won by Major C. A. Lutz of the U. S. Marine Corps, and the endurance and altitude records set by the Navy plane P. N. 12. In the marine race Major Lutz used B. G. Mica Hornet plugs. In the endurance and altitude records set by Lieutenants Soucek and Gavin B. G. IXA plugs were employed.

The B. G. Corporation, 136 West 45th Street, New York City

MANUFACTURERS OF THE  
B. G. AIR COAST AND  
SEA RAY ENGINE BUILDERS

**B. G. "HORNET"**  
**MICA SPARK PLUGS**

CHANGE READ for masthead AVIATION



The Hornet  
(actual size)

**Newly Granted Type Certificate Approves  
Curtiss Robin for 2217 lb. Gross Weight**

WORD WAS recently received from the Aviation Branch Department of Commerce, that the Curtiss Robin has been granted its aeronautics approved type certificate. The plane has been approved to carry 4 passengers or 2217 lbs.



Cabin view of the Curtiss "Robin" showing the pilot's seat and instrument panel.

and at weight 1,480 lbs. empty, the gross weight is 2,217 lbs. The Robin, which was described in detail in the May 21 issue of *Aero-Aviation*, is a closed cabin monoplane powered with a Curtiss OX-5 engine. The design was engineered by the Curtiss Aeroplane & Motor Co., Glendale City, L. I., N. Y., and is being put into production by the Curtiss-Robertson Aircraft Mfg. Co. of Augusta, St. Louis County, Mo.

**Output of Aircraft for 1927 is Reported  
To Total 1,962 Planes Worth \$14,250,605**

THE DEPARTMENT OF COMMERCE announces that, according to data collected at the annual census of manufacturers taken in 1926, the establishments engaged primarily in the manufacture of aircraft in 1927 built 1,962 airplanes, valued at \$14,250,605 and 105 seaplanes and amphibians, valued at \$1,208,030. The production in 1926 was 1,625 air planes, valued at \$7,445,259 and 61 seaplanes and amphibians, valued at \$1,622,348. The combined production of all classes of low-speed aircraft (seaplanes, amphibians, and monoplanes) increased from 1,186 valued at \$8,071,025 in 1926, to 1,962 valued at \$14,250,605 in 1927, the ratio of increase being 65.4 per cent. for number and 80.4 per cent. for value. A similar comparison for 1925 and 1926, based on a production of 780 aircraft, valued at \$6,079,059 in 1925, showed an increase of 145.7 per cent. in number and 135.5 per cent. in value.

Of the 105 establishments reporting for 1927, 35 were located in New York, most east of California and Michigan, East each in Illinois, Missouri, and Ohio, three each in New Jersey and Pennsylvania, two on Maryland, and one each in Colorado, Connecticut, Iowa, Kansas, Nebraska, Virginia, Washington, and Wisconsin.

The statistics for 1927, 1926, and 1925 are presented in the table on the following page. The figures for 1927 and 1925 were compiled from data collected at the regular annual census of manufacturers; those for 1926, from the returns made at a special census of aircraft production. The

1927 figures are preliminary and subject to such revision as may be found necessary upon further examination of the returns.

**AIRCRAFT APPROVED FOR THE UNITED STATES  
1927, 1928 AND 1929**

	1927	1928	1929	Per cent. of change
Number of establishments	4,705	5,000	5,000	—
Value of products	\$10,141,000	\$130	\$14,250,605	—
Cost of materials, fuel, and purchased power	\$1,924,000	\$100	\$1,622,348	—
Net worth, less current liabilities and taxes	\$7,000,000	\$100	\$8,627,657	—
Class of business plan	100	100	100	—
Product, total value	\$17,700,000	\$170	\$15,800,000	—
Monoplane	41,000	41,000	71,000	71,000
Seaplane	41,000	41,000	41,000	41,000
Amphibian	41,000	41,000	41,000	41,000
Product, value	\$17,700,000	\$170	\$15,800,000	—
Monoplane	41,000	41,000	71,000	71,000
Seaplane	41,000	41,000	41,000	41,000
Amphibian	41,000	41,000	41,000	41,000
Product, value	\$17,700,000	\$170	\$15,800,000	—
Parts and engines made for sale, value	\$1,924,000	\$100	\$1,622,348	—
Parts and engines sold in existing plants and in existing plants, value	\$1,924,000	\$100	\$1,622,348	—
Value added by manufac- turer	\$10,141,000	\$130	\$14,250,605	—
Value added by manufac- turer, percentage	53.0	53.0	53.0	—

These figures differ from those originally published for 1926 because the statistics have been revised in the 1926 report of data on manufacturing and advertising, and the 1927 figures have been revised to show more accurately the 1927 figures.

**Non-fractionating self-tightening propellers**

The amount of non-fractionating propeller can not be calculated from the figures because for the propeller value can not be calculated in detail. It is estimated that the propeller value can be taken as 10 per cent. of the non-fractionating propeller value.

Estimated 1926 value of passenger aircraft was \$1,100,000. Estimated 1927 value of passenger aircraft was \$1,100,000. Estimated 1928 value of passenger aircraft was \$1,100,000. Estimated 1929 value of passenger aircraft was \$1,100,000.

**Parts and engines made  
for sale, value**

**Parts and engines sold  
in existing plants and in  
existing plants, value**

**Value added by manufac-  
turer**

**Value added by manufac-  
turer, percentage**

**Parts and engines made  
for sale, value**

**Parts and engines sold  
in existing plants and in  
existing plants, value**

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**Value added by manufac-  
turer, percentage**

# STEEL



Tapping in new sheet  
steel Company Photo  
This Company is a com-  
pany that is building in  
every way to meet the  
needs of time and its  
products.

## An expression centuries old true as Steel

**"Safety action  
Takes no休休  
—Class**

SINCE steel was first known, it has been celebrated for its valuable qualities and around the world for centuries the expression "true as steel" has been used to express the quality of honest, strong, and reliable. In every country where steel has been used, it has been used to express the quality of honest, strong, and reliable.

It is because it possesses that quality of "strength" that steel has become so essential to modern civilization—and because it is the strength of steel that makes it the standard of travel by air, land, and sea, in the development of industry and commerce.

Steel is unique in that it is the only metal that can be forged, rolled, and drawn, and it is the only metal that can be heated, cooled, and hardened without loss of strength.

So the kind of aircraft, certain of the properties of which are of special importance, it has unusual strength in proportion to its weight. Its behavior under stress can be calculated with great precision. Properly designed parts of aircraft can be made to withstand greater stresses under prolonged and other repeated pressures.

Steel is not subject to dry rot or similar forms of gradual degeneration. It is strong, tough, lasting, dependable.—E.R.U.

The aeronautical industry uses millions of steel rods—grade—the best obtainable. Builders of aircraft and equipment find Bethlehem a source of supply of rods of the very highest quality and reliability. They are available in all sizes and shapes, and in every grade and condition.

In addition to these, the company manufactures

steel beams and columns for buildings, structures, and other general facilities.

During more than half a century devoted to the manufacture of steel and steel products, Bethlehem has pioneered many new methods and appliances of basic importance.

**BETHLEHEM STEEL COMPANY** General Offices: Bethlehem, Pa. District Offices: in New York, Boston, Philadelphia, Atlanta, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, and Portland, Oregon. Steel Distributors: New York, Cleveland, Pittsburgh, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, and Portland.

Bethlehem Steel Corporation, New York City  
Publisher of *Steel* and *Metals*.

# BETHLEHEM

TRADE SHOW for meeting AVIATION

# REVIEWS

The most important aviation news from 1937 is in this book. This book can supply all basic information about present-day publications. It is a valuable addition to the library of anyone interested in the field of aviation.

*Last of the Air*—by Carl Scholten. Bruce Publishing Co. \$20 pages.

The author, who has written many books on various phases of life, has endeavored to write a book that will meet with the requirements of commercial aeronautics but in such a way as to eliminate all uncertainty. The book is an expansion of three articles which appeared in 1937 in the *American Law Review* and which correspond to the first three chapters of the book: Airspace Rights, Governmental Control, and Damage Liability. The additional chapters, Insurance, Patent Rights, and Radio, have appeared in part in the *Marquette Law Review*. The articles have all been revised and brought up to date. In addition, there is an appendix including International Air Navigation Convention of 1929, Air Commerce Act of 1938, Air Commerce Regulations, etc. The Act of 1932, Uniform State Laws of Assassination, General rules of the Federal Bureau of Investigation. There is also an index at the end of the book.

*Technical Publications Received*

N.A.C.A. Technical Note No. 279—Special Propeller Features; by A. S. Heim, Forest Products Laboratory.

N.A.C.A. Technical Note No. 280—Preliminary Investigations on Boundary Layer Control by Means of Section and Pressure with the U.S.A. 27 Aerofiles, by E. G. Reed and M. J. Rauscher, Langley Memorial Aeronautical Laboratory.

Army Air Corps Information Circular No. 209—Comparative Strength of Various Chassis (Airplane Strength Report); by H. E. Miller, Material Division, Wright Field.

Army Air Corps Information Circular No. 967—The Design of Any Aircraft (Airplane Strength Report); by L. V. Kistler, Material Division, Wright Field.

## Newly Formed Commercial Airways Corp. Takes Over Richards Field, Kansas City

RICHARDS FIELD, formerly the principal site of a small airfield near Kansas City, Mo., has been taken over by the Commercial Airways Corp. and will be improved and operated as a general flying field. The airport has been used by several flying schools since the opening of the municipal airport and the transfer of the Army reserves and mail planes to the new field.

The new concern is headed by Albert A. Tomason and Leslie Gregory. Tomason and his company would start the improvement of the field with the construction of runways from the highways to the grounds and the building of better hangars. Hangars will be built as fast as needed. Part of the field across and out with gas and tracks, will be leveled and graded.

The company has opened offices in the Mercury Building, Third and Grand. A complete line of parts for planes is carried by the company.

The Frontier Flying School, operated as a concern in the factory of the American Eagle Aircraft Corp., includes the factory of the American Eagle planes, will continue to use Richards Field. The field was established in 1928 by a group of Kansas City men who organized the Air Transport Association, an index at the end of the book.

## Sistema Scenic Air Tours Company Formed For Trips Over Detroit and Air Taxicab Work

ORGANIZATION OF THE Sistema Scenic Air Tours was announced recently by Edward A. Stroh, president of the Sistema Aircraft Corp., Detroit, and Jack Whittaker, of the Tulwaeke Old Gid Corp. The new company was formed for the purpose of furnishing scenic air tours over Detroit and for aerial taxi service to top points in Michigan. Scenic plane trips will be used and operations will be carried on from the Sistema Aircraft Corp. field at Northfield.

Service was started with the Elgin excursion in which George and George W. McAllister made their world's gasoline record of 2014 mi. at Jacksonville, Fla. The plane, a twin craft in which Sistema flew on the Spokane nonstop derby, is in the personal property of Sistema. Additional equipment will be placed in service later.

Whittaker, who holds a 30,000 sq. mi. aerial taxi contract with the State of Michigan following the National Air Races in 1937, served in the French air service during the World War. He has been connected with aviation since 1917. By arrangement of the Sistema Scenic Air Tours will be a change of Charlie Olson, a World War pilot, and pilot of 2014. The new company is not affiliated with the Sistema Aircraft Corp.

## Michigan Professors to Aid Department Of Commerce Aero Branch This Summer

PROFS. EDWARD A. STROH and L. V. KISTLER of the aeronautical faculty at the University of Michigan and Joe Atwell will assist the aeronautics branch of the Dept. of Commerce at Washington from June 15 to September 15. They will work with the department in checking engineers of aircraft submitted by aircraft manufacturers as new type & weight designs for the Bureau's approval.

Professor Stroh is assistant professor of aeronautics and Professor Kistler is the Gasoline professor of "Flight Aeronautics" at the University. Both men have had a wide side experience in the consulting field of aeronautics & aircraft engineering.

# One Distributor Sells 79 WACO Airplanes

## Mid-west Airways of Monmouth, Ill. delivered the following WACO'S

Serial No.	Name	Location
1	Waco Bi-Plane	Chicago, Ill.
2	A. C. Rivers	Chicago, Ill.
3	A. W. Kilian	Lakeview, Ill.
4	N. L. & M. M. Stevens	Waukegan, Ill.
5	W. H. Johnson	Dickinson, Iowa
6	J. A. Walker	Dickinson, Iowa
7	J. D. Knutson	Chicago, Ill.
8	J. D. Knutson	Chicago, Ill.
9	W. W. Estill	Wichita Airport
10	F. L. E. Frazee	Chicago, Ill.
11	Archie J. Smith	Chicago, Ill.
12	Wilson-Hester Aviation Co. Inc.	Monmouth, Ill.
13	Robert W. Johnson	Des Moines, Iowa
14	M. M. W. W.	Des Moines, Iowa
15	W. L. Ward	Chicago, Ill.
16	John W. Johnson	Chicago, Ill.
17	John W. Johnson	Chicago, Ill.
18	W. E. Kilby	Lyons, Ill.
19	W. E. Kilby	Des Moines, Iowa
20	T. E. Tamm	Des Moines, Iowa
21	Field Keppen	Chicago, Ill.
22	Walter Atwood	Waukegan, Ill.
23	D. L. Olson	Chicago, Ill.
24	Jack Edwards	Monroe, Ill.
25	A. E. Edwards	Chicago, Ill.
26	G. L. Nichols	Chicago, Ill.
27	W. W. Kilian	Monmouth Field, Illinois
28	W. W. Kilian	Monmouth, Ill.
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78	W. W. Kilian	Monmouth, Ill.
79	W. W. Kilian	Monmouth, Ill.

The above list contains no resales or trade-ins.



The Advance Aircraft Co. TROY OHIO

## Last Minute Briefs

The North American Airways Co. has been organized at Appleton, Wis., with a capital of \$500,000 by K. M. Blasius, F. E. Schlesin, and George H. Schmidt.

Friedrich Knack of Anstoetz, Inc., Milwaukee, Wis., aeronautical engineering company, has sailed for Europe to study foreign methods of aircraft construction.

That leather is now available commercially has been announced by the Edible Company, Louisville, Ky. That concern has discovered new natural oil fields and has developed an improved method of extraction, which is new in the industry, state, plan.

Free lectures on aviation are being given each Wednesday night by the Pacific Technical University at San Diego, Calif.

St. Paul, Minn., has been designated as a possible airport, the St. Paul Municipal Airport, having been selected by the Treasury Department because of its proximity to the city's regular vacation office. This is the second such selection, the first being at Key West, Fla.

President Coolidge has signed the bill authorizing the Secretary of the Interior to lease for airport use public lands not to exceed 446 acres. The leases would apply for periods not exceeding 25 years, subject to renewal.

The aircraft carrier Lexington, whose disastrous sinking recently resulted in the deaths of the ship's crew, Navy sailors, has now been pronounced satisfactory by Secretary Wilbur. Fit to shape, the carrier recently underwent a speed of 33.0 knots with just part of her power.

Charles D. Chamberlin has been engaged as consultant to the City of New York in the construction of a municipal airport at Bayonne, N. J. The New York City Council has thereby given the title of aeronautical engineer in the Department of Works, which is building the new field.

W. H. Moore of Wichita has been elected president of the Southern Airplane Co., succeeding J. H. Turner, who plans to concentrate on the Travel Air Mfg. Co. of which he is now president. And R. Morrison replaces Turner as director.

The Boeing Company has turned out the first of the new Navy pursuit planes, the PFB-1s, for final testing. Seventy-two others of the type, all powered with Wright engines, are being built for the Navy.

Announcement has been made that the National Air Transport Co.'s capital is being increased from \$1,000,000 to \$3,000,000. Funds to equip and operate a New York-Chicago passenger line are to be thus provided.

An aeronautical information bureau has been organized by Fred H. Caley, secretary of the Cleveland, Ohio, Automobile Club. Advice and information concerning airplane travel schedules and courses will be issued.

Skyways, Inc., of Boston has taken the agency for Bissell press planes, and the Bay State Flying Service of that city has been named Meteorplane agent.

The West Coast Air Transport has announced that it has placed orders for five new Model 18 passenger, three-passenger planes. They are to be put in service between Spokane and Portland, replacing the eight passenger "Cessation" and "Lindbergh."

The first Lockheed plane sold by Am. Aviation, Inc., New York was purchased by the Halibutton Oil Field Service.

W. G. Wardlaw of MITE won first prize on \$50 and 1 MacCready of Harvard the second of \$25 in a race to see first an expert seaplane design sponsored by the Marine Arts Institute of Delray. A total of 243 plans were submitted.

The Army housing bill has been passed by the Senate. Among the towns are Boling Field, Washington, D. C., \$677,000; Cheyenne Field, Billings, \$412,000; Fairchild Air Depot, Glendale, \$403,000; Holifield Field, Muskogee, \$200,000.

A recent report states that the Wright Aeronautical Corp. of Paterson, N. J., has purchased part of the American Locomotive Works, at Paterson, which has been closed for two years. The expansion will add the company to meet the demand for engines.

A report from the New York State Corporation Bureau at Albany shows that more than a dozen aviation companies received charters in May. All gave indications of substantial backing.

As we go to press, late reports appear to indicate that General Motors have flown in the dirigible Italia et Capo Flora in France from Le Bourget. Recent expeditions are being planned to score the fallen explorers.

Anthony H. Fokker is accompanying J. Talbot, president of the Westfield Oil Co. of California, to the West Coast in the unengined Fokker F-10 monoplane which the Atlantic Aircraft Corp. has built for the oil company. The plane left Teterboro Airport, N. J., June 3.

A ground school course will be inaugurated at Yale University on October, according to H. L. Englehardt of the Yale Aeronautical Society. Some 150 students have stated their desire to enter the course, but only 25 will be accepted at the opening of the new class.

Flightless aviators have organized the Chinese Aero League of America in New York City. The president of the group is Dr. Tim Lin-hsing, who plans to fly the Pacific August in his tri-engined plane, "The Spirit of China."

Air Transportation, Inc., has been appointed distributor of the Cessna 180 monoplane in Minnesota, North and South Dakota, and Wisconsin. William Wiesemann.

H. G. Wynn, chief test pilot, is putting the new United Aircraft Corp. plane through its paces at Wichita. The new airplane, known as the Liberty, is a four passenger transport plane designed by Fred H. McCaughan. It is Wichita's second type of commercial plane.

These new agencies for the Stearman planes have been announced. They are Commercial Airways, Inc., Kansas City; Leonard Richards of Philadelphia for Eastern Pennsylvania; and Harold Hartung of Detroit. The Richards contract calls for the delivery of 10 planes within the next few months.

# WHO'S WHO in American Aeronautics

## 1928 Edition

### The Blue Book of American Airmen

**Contains Over Two Thousand Biographies of Aviators, aeronauts, aeronautical engineers, aircraft manufacturers, aircraft necessities manufacturers, flying field owners, American aces, aeronautical instructors, inventors, aeronautical writers, sportsmen, men prominent in aeronautical affairs.**

Price \$1.00 per copy

Lester D. Cardine,  
Aviation Publishing Corporation,  
200 West 13th Street,  
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Enclosed please find One Dollar for copy of Who's Who in American Aeronautics. (No extra for postage and shipping.)

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# The Monocoupe



## The Golden Franchise of the Ultimate Plane for the Private Owner

**O**UR MAIL brings us scores of inquiries every day regarding our franchise.

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Front view of the Vickers "Vigil".

The landing gear attached at the points where the ribs meet the lower wing. The whole structure, except the upper wing, is of metal, fabric covered. All bearing in due to steel struts with no wires used. The undercarriage is of oleo-pneumatic type with a wide track. All metal parts are specially protected against atmospheric influences, and the surfaces are such that maintenance costs are low.

The span is 35 ft. 2 in. and a length of 27 ft. Empty it weighs 1,150 lb., and with two people it has a dispensable load of 850 lbs. The maximum weight 2,000 lb. It covers 82.6 mi. of ground when held at constant for 4.7 hr. at 800 r.p.m. at a cruising speed of 116 mph. The high speed is 130 mph and landing speed 50 mph. It is stated to have a service ceiling of 25,000 ft.

### Concerning 12 Cylinder Fiat A.S.3 Engine Used by de Bernardi in His Record Flight

DATA WAS recently received in this country on the Fiat A.S. engine used by Major de Bernardi in establishing the World seaplane record of 318.03 mph. The engine is a 12 cylinder V type with a bore of 5.06 in. and a stroke of 5.61 in. The total displacement of 2,915 cu. in.

The A.S.3 is the engine that was designated, but its cylinders are in two rows with a radius of 12 in. between them.

The cylinders are of forged steel, mounted in a cast steel water jacket and welded directly to a crankcase, flywheel, and compression topplate. The piston are machined from forgings with three compression rings and one oil scraper ring.

The crankshaft operates on seven bearings, which are roller bearings, with a double thrust bearing at front and allowing the use of either a pusher or tractor propeller. The connecting rods are 2 sections of solid-chrome steel.

In the head of each cylinder are four valves actuated by two overhead camshafts driven from the rear of the crankshaft. The intake manifolds are bolted by a water jacket and the air intake is so constructed that they will operate regardless of the position of the engine. Camshafts spark plug feed, connected to two Kwassi magnets driven from the rear of the engine. In addition is a hand cranked oil meter for starting, there is a small auxiliary motor to be used for priming and injecting a mixture of gasoline at about 125 lb. per cu. in. into the cylinders on com-

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## New Beacon Airways Company of Kansas

### City is Prudden and Cessna Plane Dealer

THE BEACON AIRWAYS OF AMERICA, INC., a Delaware corporation in which several Kansas City men are interested, has opened offices at 1108 Wyandotte Street, in the Kansas City Board of Trade Building. Included in the list of directors are Chester W. Hinsangway, president and general manager; Chester W. Angleton; Joseph W. Porter, Jr.; and F. L. Legge, Jr.

The company has obtained distribution franchises for the Prudden triengines at steel prices and the Cessna single- and two-cylinder air-cooled motors. Other non-competing models will be sold by other dealers, according to the statement.

During the first six months the company will operate in its testing school in which all kinds of flying necessary to qualify for a pilot's license will be taught. The company also will handle a complete stock of aircraft manufacturers' and distributors' supplies, instruments and equipment, both direct and through dealers. The company also plans to own and operate its own test and repair bays.

Mr. Hinsangway is also president of Beacon Airways, Inc., operating at various points on the Pacific Coast with offices and fields in San Francisco, Los Angeles and Fresno, Calif.

## Newly Formed Great Lakes Airways Corp.

### Is Ryan and American Eagle Dealer

THE GREAT LAKES AIRWAYS CORP. was recently organized with a capitalization of \$400,000 by W. E. Becker, who was elected president of the company; Max Goldberg, Cuyahoga Steamer, was a vice-president and treasurer; and Charles Deback, Max Goldberg, and the Ryan Aeroplane Corporation, for the American Eagle and the Ryan Aeroplane, that corporation will keep passengers, conduct air mail two sevens and a ground and group school under the direction of Ken Patti, the chief pilot, offer aerial photography by Kurt Pearson, and hills will be made as the possible air mail line between Duluth and the Twin Cities. The initial equipment, consisting of an American Eagle, will be supplemented within the near future by another plane or the same type equipped with floats, and two Ryan Broughams. Several agreements have been made with commercial firms, in which the planes are to be used as methods of publicity and other contracts are under negotiation for several corporate clients, and specially conducted tours for tourists.

## H. Ray McClintock Now Touring Europe Demonstrating Russell Lode Parachute

EL HAY McClintock, president of the Russell Parachute Co., is now on a tour of Europe demonstrating the Russell Lode Parachute in France, England, Germany and Italy. McClintock is visiting London, Paris, Rome, and Berlin at the invitation of the leading government officials and aeronautical societies of those countries.

The Russell Lode Parachute especially was deeply interested in the Russell Lode Parachute because of the claimed efficiency of this type of parachute and the fact that it is one standard equipment on wireless air mail and passenger lines.

McClintock took with him to Europe John Trahan, Danish parachute jumper, who is to demonstrate the practicability of the Russell lode parashute to government authorities in England, France, Germany, and Italy.

The latest prominent flier to purchase a Russell Lode Parachute for his personal use is Capt. Elmo Currans, MacCullum's military flying ace. Captain Currans personally came at the Russell Parachute Co.'s plant at San Diego to purchase the parachute which he will be will wear on his forthcoming nonstop flight from Mexico City to Washington.

## The "Wasp" Series "B" Engine

*Continued from page 1679*

All of these facts serve to bring sharply to focus the whole question that high speed is seek possible with the single row radial type. Theoretical arguments have been advanced with regard to power per pound of air-cooled heat resistance upon high speed of various types of engines. The final answer to all questions essentially comes in the air. It is freely said that the water cooled Vee engine represents the maximum of heat resistance, but it is hard to reconcile this statement with the performance of the air cooled single row radial and water cooled Vee of the same power, and in the same general type of plane. It is freely stated that the two air cooled radial or the air cooled Vee offers less heat resistance than the single row air cooled radial, but this makes



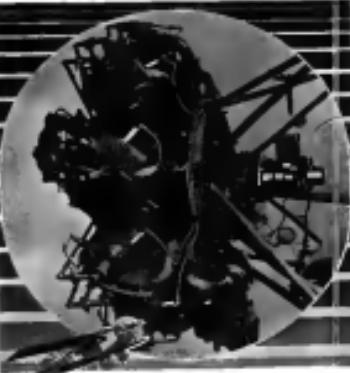
4. Lockheed "Air Express" powered with a "Wasp" engine

it hard to justify the comparative performance shown above of the Connor and the Fokker. Pratt & Whitney engineers contend that in spite of the apparent greater number of the single row radial, that least of all the total apparent disadvantage of the single row radial is exceeding, except upon careful analysis. While the extreme diameter, including the valve mechanism of the radial of the Wasp size is known to be about 36 in., measured across the heads of the cylinders, the diameter becomes about 35 in. Measuring the diameter in the case of the single row radial is least affected in performing its cooling function, due to the fact that the exposed parts of the air cooled Vee are in line with each other, and as in the case of the air cooled radial, the air is more easily directed to cool the cylinders at the rear. This theory of equal angles to cool the cylinders at the rear, does theoretical argument will never settle this problem, but proof in the air cannot be set aside.

### High Speed of 167 M.P.H.

Again as this same general question of radial heat resistance and high speed, as is interesting to consider the characteristics of the new Lockheed monoplane. This plane was designed as a fast type of mail plane, and is equipped with a Wasp. It carries a pay load of 1,069 lb. in its designate class a high speed of 178 mph using a standard 300 h.p. Commercial Wasp. It is understood that the high speed of this plane when tested recently at Wright Field by Army Air Corps experts was determined to be 187 mph. There is no commercial plane on record, water cooled or air cooled, regardless of the power, which has ever approached the performance.

Finally, let us consider the performance of the new Fokker engine Wasp F-10. Three of these planes have recently



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been delivered to Western Air Express for operation between Los Angeles and San Francisco. During performance trials it was shown that the high speed of the P-10 with its full pay load was a fraction less than 250 m.p.h. Again, it would seem that the single row radial Wasp will not jeopardize the high speed of the weight carrying planes.

The single row air cooled radial engines do dominate commercial aviation, both here and abroad. This type of engine at the present in form, most sensible, easiest to install, and has thoroughly demonstrated its extreme dependability at all stages. Because of the above qualities, it necessarily follows that its manufacturing cost and sales price is lower, as well as the fact that lower maintenance expense as compared to any other type of engine may be expected.

## The Bellanca Sesquiplane

*Continued from page 2075*

over, to reinforce it against excessive compression loads caused by landing, it has another strutwise tube slipped over it and welded in place at the ends. The tubes are continuous, with the outer tube not quite so long as the inner one. Extraordinarily heavy loads are used to carry part of the landing gear weight across the fuselage. There is a double set of left wing struts connecting the upper and the lower rear spar and the forward wing strut to the fuselage and the lower rear point. One of the two left wings from the center of the rear spar goes to that same fitting on the forward spar, while the other two pass to the corresponding fitting on the rear spar. The landing wires are single and lie in the plane of their respective spars.



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gation visible from the cockpit. The lock or control rod is a flat pedal as the cockpit sits in the action of the landing gear. At cabin drawing up the wheels are moved on a bar between the pilot's seat in the cockpit. To one side of the bar is attached a dog actuated by a lever. This lever operates on the handle of the lever, one for raising the wheel the other for lowering them. Thus, to activate the lever the landing gear, a foot pedal is pressed to move the landing gear holding the supporting tube in place. The supporting tube is then drawn back by the main cushion fast pedal preventing the wheel to be moved by the hand lever. Where the wheels are in place the landing gear is visible from the cockpit. It consists of a tall thin columned rod projecting from the leading edge of



Showing the construction of the landing gear using the Stearman. Note the curved housing at the top.

the gear. The time required to fold the wheels is said to be between 27 and 35 sec and to unfold, from 7 to 9 sec—a total cycle taking 24 to 30 sec.

According to N. V. Blasenoff, structural engineer at the Stearman Aircraft Corp who worked out most of the mechanics, the combined weight of the retarding and landing gear is not greater than the weight of the main struts which are eliminated by making the landing gear a full truss. The longest member is only 34 in. and controlling truss is only 10 in. from the total weight of the retractable chassis is 10 per cent of the total weight of the aircraft. The retractable chassis does a long flight, in apparent distance, that only 18 per cent of total resistance is claimed to be eliminated although 20 per cent of the total resistance is due to the landing chassis in Army Air Service standards, it means that 18 per cent of the power could be saved. In this case it means 28 hp. and assuming a load of 20 lb. per hp., this means an extra load of 20 times 28, or 560 lb. A greater of retractable landing gear mechanisms

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have been made since the war, but it is believed that this is the first commercial design to drive the wheels completely out of the frame. It will be recalled that A. V. Verstraete, then of the Army Air Service, designed a retractable landing gear used on the Avro 504K biplane in the 1922 Pulitzer Race. It is understood that the maximum speed of this plane with the landing gear out was 302.6 m.p.h. while the maximum speed with the gear retracted was 181.1 m.p.h., a difference of 20.3 m.p.h.

Mounted at the outer end of the lower panel at the auxiliary wing. It meets the lower wing panel at a sharp angle and is fastened to it by shear sleeves. As has been mentioned before, it has a double taper and follows usual wing construction, with two struts continuing at a point about five feet from the wing. From here the wing is replaced by two semi-circular plates attached to the main wing, one in each upper. The auxiliary wing beams are non-rotating sections, and in spite of the fact that the wing has no greater dimensions than the main wing, the semi-circular plates are longer than the latter. These points are hardly stressed, and may be considered with greatest safety. The struts connecting the upper wing are fastened with half-sleeves so that they can be broken easily. It has been stated that the lifting capacity of these struts permits it to be conducted with an exceptionally high safety factor which provides a positive support to the upper panel.

The fuselage resembles those of most other Bellanca models; it retains the torsion-like section as pronounced on the Gull-birds. In fact, the fuselage is almost identical to that of the Columbia except that it is considerably elongated while width and depth are just proportionately enlarged. The overall length of the plane is 28 ft. In construction it is similar to the other Bellanca planes except for a few refinements in

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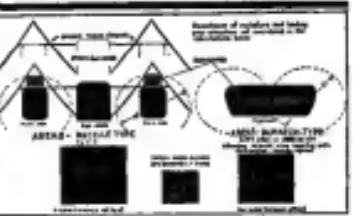
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第1章第3節　Windows 8.1の基礎

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DESIGN



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- Increased capacity of the fuselage
- Structural efficiency and simplicity
- *Practical Landing Gear Retraction*



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non-inflammable cellulose mounted on a sliding frame permitting the window to be moved back along the side of the fuselage. This provides a large opening for entrance or exit in sky diving or permits the pilot to put his head outside to increase his vision to the rear and downward, as well as forward. The forward vision from the cockpit is excellent, due to the high position of the pilot. Even with the tail on the ground one can see over the cylinder of the engine through the flat non-shattering glass windows. To increase the range of vision ahead and to the rear, the seat of the cockpit and the winter section of the wing is one large transparent window. The cockpit is open wide and roomy; it is approximately four feet wide and very deep and long. The floor is of light wood. The top and side panels are six inches of the 40 grit oak wood with heavy corduroy on top of the back, we are square as provided between tank and controls. As it is quite large, the cockpit should be very comfortable on a long flight. Proper ventilation is assured by the easy sliding side windows which are supplemented by small vent holes at the floor at the right side of the cockpit. That is a very novel device; it consists of a hinged sash, about five inches square, located in the side of the engine cowling. A special clamp with a spring and foot pedal are attached in such a way that one can open the vent by merely stepping on the pedal. To close the vent, the pedal is depressed to disengage a catch and the spring closes the sash. The engine is in a compartment separated from the cockpit by a sheet aluminum screen sealed with adhesive.

Steel sole by side wheels rotated as provided with either actuating all the control surfaces. The wheel controls are of the usual type except that the wheels themselves are of metal covered with cloth. Steeped type foot pedals are used. At the left of the cockpit is a wheel control for the stabilizer adjustment. Between the pilots, on the floor, are the looking

holes for the landing gear. In the floor is a button holding the breaking rite which is controlled by a foot pedal. Located on the cross housing tubes just above the oil tank is mounted the plates, in the mechanism for drawing up the chain. Thus clockwise of the drum on which the cable is wound is the one side of drum is sprung of the dogs connected to it, and hence to draw up the landing gear.

There are two instrument boards, one for flight instruments and the other for engine instruments. The flight instruments



The Bellanca Model K at Roosevelt Field, Long Island, after first flight.

are mounted on a wide panel extending the width of the cockpit, while the engine instruments are mounted on a small triangular panel below and behind the larger instrument board. All the buttons of the instrument board are the compact variety, consisting of Bechtel, spark and medium metal. Above these are the Consolidated air temperature and pressure gauges while at the top is the Eastman-Kodak pressure. Bechtel air dry clock, Bechtel magnetic compass, and navigation light switch. There are four instruments across the top of the other instrument board and two below. All of these were made by the Prosser Instrument Co.; they are from left to right: the earth indicator compass indicator, inclinometer, air

speed indicator, and altimeter. Below are the bank and turn indicator and the rate of climb indicator. Small lights are provided on each instrument board for night flying. On the floor at the right is a Dupont hand fire extinguisher while in front of the right wheel is the heavier magazine. In front of the left wheel is the central panel for the fuel system. The tanks in quick couple lead to prevent mistakes, all controls are paper marked. Fuel may be diverted from any tank to any of the others and any tank can be connected directly to the carburetor. However, it is planned to have the gasoline pumped from the main tank to the wing tanks and feed to the engine by gravity. Transposed members on the plane return reinforced the head of the gasoline and the overflow from the wing tanks to the main tank. The main tank is of welded sheet steel built by the Pennsylvania Welded Sheet Metal Products Corp., while the wing tanks are entirely riveted and built by Worcester & Co. Large valves are provided so that the tanks can be drained in less than a minute. Each tank is fitted with a float valve.

The specifications supplied by the manufacturer are the Model K, the four distance type, and the smaller Model P, a maximum transport type, see as follows:

Length overall	38 ft. 1 in.
Height overall	13 ft. 6 in.
Span upper wing	64 ft. 6 in.
Span lower wings horizontal projection	36 ft. 5 in.
Gap at Tastings	5 ft. 6 1/2 in.
Mean gap	.7 ft. 3 1/2 in.
Wing area, including ailerons	680 sq. ft.
Airline area	54 sq. ft.
Passenger area	31 sq. ft.
Crew area	32 sq. ft.
Fus area	22.5 sq. ft.
Bottom area (balanced area 3 sq. ft.)	39.5 sq. ft.
Power plant, Pratt & Whitney Hornet .500 hp at 2900 rpm	
Propeller, (Purd) adjustable on the ground	
Cabin capacity	3-5-3-3-3-3
Total of wheels	10

Model K Model P

Weight empty, with normal equipment	4,000 lb.
Per load	3,500 lb.
Useful load	3,000 to 3,600 lb.
Gross weight	10,000 to 12,600 lb.
Wing loading	13.8 lb./sq. ft.
Power loading	1.25 lb./sq. ft.
Estimated performance	
High speed (at 5000 rpm)	140 mph.
Cruising speed	135 mph.
Landing speed (4000 rpm)	41 mph.
Climb	.900 fpm.
Service ceiling	16,000 ft.
Gross takeoff capacity	1,000 gal.
Ranges at cruising speed	3,300 mi.
	728 mi.

## The Problem of Aviation Insurance

Continued from page 2680

\$5,000, or 50 per cent. of the actual value. Should loss or damage occur, the owner that would receive 20 per cent. and the insurance company 50 per cent.

Total, however, the amount of cover, is defined as a percentage, namely, 50 per cent. of the value of the plane at the time the policy was issued, plus the salvage value, and is equal to exceed a stated percentage. Thus if the proportion is 50 per cent. of the value of the plane less the salvage value, the "proposed" value of the plane less the value of the salvage is paid when the cost



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Length	8 ft.
Height	7 ft.
Wing area	215 sq. ft.
Stabilizer area	14 sq. ft.
Stabilizer area	14 sq. ft.
Rudder area	14 sq. ft.
Fuselage area	14 sq. ft.
Fuselage area	4 sq. ft.
Weight empty	815 lb.
Useful load	550 lb.
Total weight	1465 lb.
High speed	220 mph
Low speed	35 mph
Cruising speed	110 mph
Climb	800 fpm
Ceiling	20,000 ft
Cruising range	800 mi.
Power plant	Kinner K-5
Gas consumption	7 gal. per hr.
Oil consumption	2½ pt per hr.

## The Boeing B-1D Flying Boat

Continued from page 268

winged spars, are housed laterally by a horizontal tube to prevent them.

The engine is mounted on a base of round steel tubes welded together. The mount consists of two tubular rings with tubes bearing them face and side. The rear ring, on which the engine is bolted, is supported by the rear stabilizer, by two members extending to the forward upper fitting of the lower wing on each side of the hull, and by an additional member extending to the forward spar fitting at the center of the upper wing. The rear ring of the mount is braced to this same fitting where the forward spars of the upper wing are joined. In the mount, which is covered over with sheet aluminum to form a streamlined nacelle, is a five gallon oil tank. Overhead is carried in tanks installed in the upper wing.

### Hull of Simple Design

The hull is of simple design, having sides inset extended to provide easy landing on the water cushioned with minimum air-resistance efficiency. The sides and rear deck are flat, while the bottom has a straight V with a single step just under the wing. Behind the step, the angle of the V is increased until the bottom is about one foot back on the windshield in front of the cockpit. The nose of the cabin is flat and the depth of the cabin decreases gradually toward the rear to provide proper clearance for the 8 ft. B propeller. The hull is constructed of two-ply monogel planning hulls in a frame structure of oak, ash, and spruce.

Passenger and pilot are carried in a glass enclosed cabin arranged with comfortable upholstered seats easily removable through three latches. The ceiling of the cabin is lined with fabric, of planning wood, to harmonize with the mahogany finish of the wood. A dome light is provided and a small heart breaker. The windows are made of sheet metal of sheet metal safety glass. They can be opened or closed by a convenient arrangement. There is a double door, giving perfect vent and good vision, a desirable feature for passenger work. There are two hatches in the roof of the cabin and a third leading to luggage and mail compartment in the rear.

The front fairing surfaces are constructed of wood, while the movable surfaces are of welded steel tubing. All are taken care of. The horizontal stabilizer has been redesigned with

a adjustable on flight to compensate for any difference in balance or an varying loads. It is supported by the steering legs in two struts to each side of the hull. The leading edge is moved forward to make the setting adjustable. The adjustment mechanism is contained in the vertical fin, which is set in below the stabilizer and built as an integral part.



Illustration of the new Boeing B-1D Flying Boat (Whitford).

of the hull. Both elevator and rudder are of the horn balanced type, while ailerons are balanced, extending out to the wing tip. All control surfaces are actuated by cables.

The general characteristics of the Whirlwind model, as supplied by the manufacturer, are as follows:

Length	39 ft. 8 in.
Height	12 ft.
Wing area	280 sq. ft.
Gross weight	2700 lb.
Useful load	400 lb.
Weight empty	2042 lb.
Prop. weight	725 lb.
Total load (including 40 gal. of gasoline)	10990 lb.
Total weight	10485 lb.
Empty fuel load plus normal load 300 lb. at 50 gal. gasoline	Wright R-1820-90, 300 hp. at 1800 rpm
Propeller	8 ft. 3 in. dia., 4-bl. B-10 prop.
Fuel loading rate	74 lb. per cu. ft.
Fuel loading weight	172.5 lb. per cu. ft.
High speed at ground	185 mph
Low speed at ground	55 mph
Riding speed, full load	220 mph
Rate of climb at 10,000 ft.	3400 ft/min.
Service ceiling (20 ft. visibility)	12900 ft.

### Fuselage Analysis

Continued from page 268

#### Moments of Wing Beams

High Incidence—Lift and Drag Loads on the Fuselage

Force	Magnitude	Moment Arm	Moment
Front Spar	Lift	331	13.8
	Drag	-902.4	-29.12
Star Spar	Lift	330	-25.7
	Drag	—	30.32
Front Strut	Lift	43.90	-7.2
	Drag	-145.6	-56.55
Star Strut	Lift	1947	-12.2
	Drag	676	-26.88

Front rating up and back are positive. Rear arms measured above and forward of CG are positive. If the moment arm for signs just indicated is followed it will be found that counter-clockwise moments will come out

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components of the design panel loads in the following table. The next panel loads less chassis loads is multiplied by one-half the leading factor, at only one side of the fuselage. From the Level Landing analysis of the chassis Chapter 10, it may be found that the resultant load 53/50/58 times the vertical component of the chassis design panel loads. As before it will be noted that the total at the bottom of each column check. Thus  $T_{11} = 15 - 3800, 2800 \times 5/2 = 3700, 4700 \times 53/50/58 = 3700$ .

**Design Panel Loads—Level Landing Condition**

Panel	User	Panel Loads (Chassis Weight subtracted)	Panel Vertical Component Multiplier	Total Panel Loads (Chassis Weight subtracted)
I-1	150	11750	53/50/58	11750
I-2	150	2350	53/50/58	2350
I-3	150	2350	53/50/58	2350
I-4	150	4700	53/50/58	4700
I-5	150	4700	53/50/58	4700
I-6	150	4700	53/50/58	4700
I-7	150	4700	53/50/58	4700
I-8	150	4700	53/50/58	4700
I-9	150	4700	53/50/58	4700
I-10	150	4700	53/50/58	4700
I-11	150	4700	53/50/58	4700
I-12	150	4700	53/50/58	4700
I-13	150	4700	53/50/58	4700
I-14	150	4700	53/50/58	4700
I-15	150	4700	53/50/58	4700
I-16	150	4700	53/50/58	4700
I-17	150	4700	53/50/58	4700
I-18	150	4700	53/50/58	4700
I-19	150	4700	53/50/58	4700
I-20	150	4700	53/50/58	4700
I-21	150	4700	53/50/58	4700
I-22	150	4700	53/50/58	4700
I-23	150	4700	53/50/58	4700
I-24	150	4700	53/50/58	4700
I-25	150	4700	53/50/58	4700
I-26	150	4700	53/50/58	4700
I-27	150	4700	53/50/58	4700
I-28	150	4700	53/50/58	4700
I-29	150	4700	53/50/58	4700
I-30	150	4700	53/50/58	4700
I-31	150	4700	53/50/58	4700
I-32	150	4700	53/50/58	4700
I-33	150	4700	53/50/58	4700
I-34	150	4700	53/50/58	4700
I-35	150	4700	53/50/58	4700
I-36	150	4700	53/50/58	4700
I-37	150	4700	53/50/58	4700
I-38	150	4700	53/50/58	4700
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I-41	150	4700	53/50/58	4700
I-42	150	4700	53/50/58	4700
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I-48	150	4700	53/50/58	4700
I-49	150	4700	53/50/58	4700
I-50	150	4700	53/50/58	4700
I-51	150	4700	53/50/58	4700
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I-53	150	4700	53/50/58	4700
I-54	150	4700	53/50/58	4700
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I-58	150	4700	53/50/58	4700
I-59	150	4700	53/50/58	4700
I-60	150	4700	53/50/58	4700
I-61	150	4700	53/50/58	4700
I-62	150	4700	53/50/58	4700
I-63	150	4700	53/50/58	4700
I-64	150	4700	53/50/58	4700
I-65	150	4700	53/50/58	4700
I-66	150	4700	53/50/58	4700
I-67	150	4700	53/50/58	4700
I-68	150	4700	53/50/58	4700
I-69	150	4700	53/50/58	4700
I-70	150	4700	53/50/58	4700
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I-156	150	4700	53/50/58	4700
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I-172	150	4700	53/50/58	4700
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I-197	150	4700	53/50/58	4700
I-198	150	4700	53/50/58	4700
I-199	150	4700	53/50/58	4700
I-200	150	4700	53/50/58	4700
I-201	150	4700	53/50/58	4700
I-202	150	4700	53/50/58	4700
I-203	150	4700	53/50/58	4700
I-204	150	4700	53/50/58	4700
I-205	150	4700	53/50/58	4700
I-206	150	4700	53/50/58	4700
I-207	150	4700	53/50/58	4700
I-208	150	4700	53/50/58	4700
I-209	150	4700	53/50/58	4700
I-210	150	4700	53/50/58	4700



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# SIDE SLIPS

By ROBERT R. COBURN

A technical magazine published in one of the eastern universities wandered into the office a few days ago, and, due to thereon an article on aerodynamics, we glanced through. The following explanation, taken from the article, has a seeming typographical error in it, which made the defense of "berthing" rather more graphical than the author intended. "Berthing is the edifying of air on top of the wing which causes dangerous loss of lift after the berthing point is reached." It had only been written "Berthing is the edifying of the air which she stalls for the first time." The inscription would have been perfect.

Mr. E. D. Mc is our regular staff of Aviation till has radio our attention to a newspaper description of a new Airlines plane, which states "The plane is known as a more plane because of its pendant wing construction."

What do you make of that, Watson?

Now that aeronautical news is getting to be less unimportant than it used to be, the editors seem to be adding their own comments to give it a bit of life. Mr. E. D. Mc concludes a clipping with a note—"Berth's a clipping from the Minneapolis Journal. No one was part in the second landing so the corresponding editor puts on a finishing touch by adding the last line. Does people like to help a good thing along, don't they?"

The man talks of an attempt to break the world's endurance record for airplanes, which failed because of engine trouble, and at the end of the paragraph in the note "Pals are used to half more people than bats."

The man talks of an attempt to break the world's endurance record for airplanes, which failed because of engine trouble, and at the end of the paragraph in the note "Pals are used to half more people than bats."

A representative of Popular Mechanics mentioned the fine picture of a tail spin we have over each, the thanks for the situation existing in this case being H. K. J. of Pittsfield, Penna. The picture shows a plane falling down, and first, and spinning. The caption is "Plunging Out of the Clouds at Highspeed Tail Spin. Aviators Have Gone to Death Because of Trust in Their Cars."

Finally, though, it takes only a little keeping around the hangar and flying field office to turn the average student not to believe his ears at all.

An example seems to be writing the column for us that week we might as well flush with a letter which L. D. received from a friend, and will not go to us. The letter contains a description of a new baby brother, recently arrived in the family, and as the writer is only 16 years old, it furnishes additional proof that the young generation will take aviation for granted, and that they already know more about it than the older generation.

"On the debate lines, but built for long service; only a two blower but powerful, small but of great fuel capacity. Equipped with a load pointer of small proportion but precise capable of spanning great distances, and with only a 10 foot landing gear. Stability not increasing to prevent us yet, but to be unnecessary, but already possesses qualities of permanence. The designers claim the three fruits of stability can be had in one, and the two others. They are not afraid of its surface qualities that they assure us that when it is fully developed, and of course to the Army Air Corps it will be promptly accepted."

# AIRPORTS AND AIRWAYS

Chicago, Ill.

The small business清淡地 lived here in the last year and is expected to double again before this year ends. Eighteen and fifteen new hotel and home Chicago every day and on an average ten additional planes will begin flights between here and Big City, Mich. These planes now carry a daily average of 3,700 lbs. of mail to and from Chicago. Not notably scarce of oxygen. In April the air mail increased to 100 lbs., as compared with 26,720 lbs. in April, 1927.

Pasenger service between Chicago and St. Louis is to be aided by the Eastern Aircraft Corp. on August 1, according to recent announcement. The schedule calls for a one hour flight with stops at Peoria and Springfield.

A Trans Air plane begins, powered with a Curtiss 325 engine, has been purchased by the enlisted ground personnel of the 16th Observation Squadron, Illinois National Guard, for their own use as a training plane. The plane will engage an instructor and four to fly.

Airplane squatting trips over the city are growing rapidly. On a recent Sunday 355 passengers were carried by the various concern's new operating line services.

General W. M. Williams, William Williams, and Harry McDonald, bought their "Pride of Detroit" down from Detroit recently. The plane is the first to be built in the country by an amateur woman in the world to do so. Spring successfully, did he leave for "Woman in Aviation," at the Women's World Fair, held here lately. She has not been flying for 20 years at which she spent fighting a winning battle against tuberculosis at Santa Fe, her present home.

The Southdown Aviation Club has been organized with C. Barber, 9032 Prairie Street, as president. A building under rental at 6022 South Halsted Street, where engine and other equipment for ground training have been installed. A modern airplane will be bought later.

Anderson charged with the design of the Chicago's great World's Fair of 1933, recently took an airplane trip over the proposed location of the grounds, to get a notion of the planes they will have to solve.

Fargo, N.D.

By Andrew L. Johnson

It is claimed to be the largest, high-altitude interconnection field in that of the Blue Ridge on the west slope of the western Rockies. It is 26 sq. miles northeast of Colfax, Colo., and about 90 west of Reno. This field was tested by G. C. and W. T. Miller, brothers, who are survey engineers for the Department of Commerce. The station was made last fall. The site was first proposed by Gen. F. L. Lomax, former Army and small plane pilot, when the government was flying the mail.

This spot is a bare-over flat approximately eight miles long and one and a half wide. A north-south runway 5000 ft. long, and an east-west one 3000 are in use now. Both of these landing tracks are 600 ft. wide. With some more work as possible to have a runway length-wise of the flat for 5000 ft. long. Boundary lights have been placed on points to lie above the snow in the winter time.

In preparing data for a birthday celebration in honor of the completion of the first year of transcontinental air mail service by the Boeing Air Transport Co., the Men's Board, Gen. E. H. Bogard, and Fred Clark, Bay E. Mason, said that July 27, 1927, 128 tasks have been sold to air transfers,

amounting to their territory. Of this number two were sold, leaving an actual total total of 126. The points these small passenger flights go to and their number as follows: To San Francisco 65, to Sacramento 37; to Elko 3; to Salt Lake 7, to Omaha 3, to Chicago 5; these all traveled by regular mail planes. Recently a Texas business man, with imperative negotiations to be closed in San Francisco, having missed his train, chartered a special plane at the cost of \$600, in order to get there. And the flying company got him there on time and there soon.

The above passenger have total 20,000 or about 8000 average passenger business monthly.

Detroit, Mich.

By John T. Steele

Detained passengers of sky View Lines, Inc., recently announced that the company's first transatlantic service over Niagara Falls, which went from Niagara Falls to Galt, the same place in which Harry Z. Birka piloted Miss Evelyn Knobell's Lockheed to Mexico City and which later was used to transport the Birka from Germany Island to New York City. The plane recently left Ford Airport for Niagara Falls with 12 passengers, including the agents of the American and Canadian offices of Niagara Falls. Maj. John W. Lash, former Canadian Army star, is chief pilot of the company.

The Detroit Board of Commerce, the U. S. Department of Commerce, and several French American organizations of the city, recently sent their best to the French Aeromarine Mission to America, when that distinguished group of Frenchmen visited Detroit.

The committee, headed by General Paul Massénaire, arrived here in two Detroit-made airplanes, a Ford bi-engine monoplane and a Ford Avro, and remained here for five days, a longer period than their stay in any other American city they had visited thus far.

While the members of the committee visited the Ford, Ford, and Stinson planes and paid a visit to the General Motors proving grounds, near Milford, Mich.

Another Birka plane was a recent visitor on the Ford Airport. Eddie Key is from Wichita, Kan., piloting a newly purchased Northwest Whitworth biplane.

Another Birka plane was at Ford Airport recently piloted by Crocker Ross, manager of Skymore, Inc., of Boston, New England Stearman distributor. Skymore was flying the plane in from Wichita.

Schleser and Danforth Speak

Edward F. Schleser and Col. Charles D. Danforth, commanding officer of Selfridge Field, were recent speakers before the Detroit Flying Club.

A group of prominent Detroit women recently announced the formation of the Women's Aeromarine Association, the purpose of which organization is to promote aviation. Membership in the association is limited to women who actively have promoted the cause of aviation, or the wives of men directly interested in aeromarine, or either qualified or amateur pilots.

Although incorporation papers have just been received, the organization was formed shortly after the close of the All-American Aircraft Show here. Mrs. Orra Heald Blackmore,



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## ABC of Flight

By W. Lawrence LePage

With a foreword by Aviation Institute of the Army and by Lieutenant Edward F. Warner

An abridged edition of the "ABC of Flight" by W. Lawrence LePage, published by the Aviation Institute of the Army, and by Lieutenant Edward F. Warner, which has been revised and enlarged to include the latest developments in flight, aircraft, engines, planes, airports, and flying clubs. It is intended for use by students, pilots, and others interested in the ABCs of flight.

Book Department  
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TRADE TIPS for advertising AVIATION

president of the Detroit Girls' Fraternal Association, is president of the Women's Aeromarine Association. Mrs. Floyd L. Evans, wife of Floyd L. Evans, commander of the 10th Observation Squadron, M.A.C., is vice-president. Miss Mary Cooper, secretary, and Mrs. William D. Holt, treasurer. The organization's directorate includes Miss Olive Mayo, daughter of William H. Mayo, Mrs. Stanley E. Kestner, and Mr. Harry H. Graham.

## St. Louis, Mo.

By M. L. Alexander

Parkers Aeroplane is giving shows every Sunday at 10:30 A.M. and 2:30 P.M. at Parks Airport, just west of St. Louis. "Lucky Jack" Morris, who recently landed his plane in the Valley were east of the field, is going to participate.

Milt Gross, chief pilot for Von Hippelmann Aircraft Corp., took four passengers to New York and then turned the plane to Peoria, Ill., to the Wright factory to have its Wright wind engine overhauled.

In another Ryan Monoplane, owned by Anderson Corp., Inc., with E. W. Coyle, sales manager, as his passenger, they covered 600 mi., making every stop on schedule or earlier. The plane is the first of a fleet, which is to be put into operation by the leasing company for the use of oil sales executives.

"Doc" Knudsen, the mechanic who tested the engine for the Rydell, Landberg, Chamberlin, and Haldeman trans-ports, digits in at St. Lambert Field, working on Windham. His first job was as Owen Johnson's Travel Agent.

G. C. Tonguefield, who is taking a 200 hr. instruction course from Von Hippelmann Aircraft Corp., recently made a non-stop flight to Fairbanks, Alaska. The passenger was his instructor, Elmer Landberg, who runs of Fairbanks.

Mac Allister, Elmer Landberg and T. E. Hall, all of Seattle, will have a hangar and the field for the use of the Northwest Air Transport Corp. from June 20. The planes in the air will be here for three days, leaving on July 2 for Spokane, Wash., Bay College, reform, and Bay Cooper, manager of the tour, visited St. Louis recently in an Army Fokker to confer with Major Lauchert, Saltair, and Stanley Clarke, chief man of the Air Board.

## Bremerton, Tex.

By Arthur E. Neal

The municipal airport was opened back recently when a Army plane from the training center at St. Louis and its representatives from the state guard at Galveston and the National Guard unit at Houston joined with commercial fliers from nearby cities in a program under the local port of the American Legion. It was estimated that approximately 20,000 people attended the opening and more than 300 miles took Dorothy kept in the commercial planes.

The feature of the opening was a run by one of the best landing planes stationed at Kelly Field at San Antonio. Prior to its departure several of the Legion officials were given rides over the city. A number of the new Curtiss F-12s were also brought over from Kelly Field. The planes were removed from the Curtiss plant in Buffalo, N.Y., about two weeks prior to the opening.

The local field contains approximately 50 acres of land and is located just west of the city limits and adjoining the old Spanish highway and the Southern Pacific railroad tracks.

Membership is the Bremerton Aero Club which was formed less than a short time before the opening of the field but was increased to more than 200 during the two days of the program. It is expected that the club will be increased to 500 members within a short time. Officers of the organization

are: W. M. Crook, president; Frank L. Bartholomew, vice-president; Arthur E. Neal, secretary, and L. Paul Tolles, treasurer. A flying club will probably be organized soon.

## Garden City, L. I., N. Y.

By M. L. Alexander

Claude Landberg recently spent half an hour at Curtiss Field flying a small Klein monoplane. Landberg did several stunts with the plane, including a daring maneuvering the little craft between the wings of three planes that had just landed. "It is so tight that it is possible, they claim, to get the engine at 1000 ft. and just fast down glide-wise."

Tom Rancher spent a most agreeable afternoon of flying his "Tin Goose," plane. He did loops, barrel rolls, tail spins, and other acrobatics while a large crowd looked on. Rancher has given up the idea of flying the Atlantic in a Stinson Decathlon, and has purchased an old Bellanca, which has been delivered to her at Curtiss Field. She plans to fly to Germany as soon as she has made the necessary tests and has had some experience with the plane. It is her intention, as is said, to do night flying around Long Island in preparation for the come flight.

On the same day, a game of "golf golf" was played on the links adjacent to Curtiss Field. William Winans on the green, teamed with A. Caperton on the tee, and William Hammock on the green teed with M. M. Merrill on the tee. The pilots dropped their golf balls as near to the course as possible, then their partners on the green took up the play. The field was not too safe, and one was won by Hammock and Merrill.

Andy Payne, the "Speed King of the U. S. Highway," took off from Curtiss Field for Washington in a Spartan the day after he reached New York as winner of the fast race across the country. Charlie Parker was his pilot. It was Payne's first flight. Apparently he expected to enjoy the experience thoroughly, and a moment before they left the ground, he declared that if he liked flying as well as walking, he was going to buy a plane and learn to fly it.

A Jurkowitz, instructor, selected Fletcher Ayres, one of his students, recently. Ayres, who is planning to buy his own plane soon, is a member of Blair and Co., the firm which distributes the stock of the Transco International Air Transport, Inc.

Jack Smith of Air Associates, Inc., says that as addition to the Month on the way from England, they are bringing over an ANTO Avrora, the type of airplane in which Bert Hinkler flew from Australia also in which Lady Bechtel flew from Africa to England. Air Associates has the agency for the Avrora as well as for the Month. It is powered with six Hispano-Suiza engines.

## Eureka, Mo.

By Wolf E. Tarver

Activities at the Alexander Airport of Warsaw continue at an increasingly active rate. The Half Arrestor Co. has made several deliveries of new Eaghenecks, and have also signed several students.

The Northern Airways, Inc., also operating from the Alexander Airport report the sale of several additional Waco 10s, and deliveries have been made from the Alexander Air port.

Recently Ben Alexander and Brown Katsenbach of Warsaw completed a round trip to Washington, D. C., and from Washington flew to the Kentucky Derby at Louisville, and then back to Warsaw. The trip was made in a Waco 10 with a Ryan-Siemens engine.

The management reports that the 3,000,000 passenger hours in now in place on the airport, and will be operated at the request of incoming aviators desiring to land at night.

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These Cessna-Horn Buildings will be installed shortly, and some should soon be in operation.

It is also officially announced that during the dedication of the airport in August, there will be a paravane display of Army planes at the airport.

Charles today, chief mechanic of the Northern Aeroplane and Flying Service's mechanics' house, has added over three hours of instruction on a Waco 18. He now has his 10 hr. of solo work, and will soon qualify for his limited commercial license.

**Los Angeles, Calif.**  
By Charles F. McMurtry

Since the successful westward flight across the Atlantic of the German Junkers Bremen, large crowds have been following daily at Dyre Airport, Los Angeles, for a view of the all metal Junkers plane in exhibition there. Although this plane is approximately eight years old, being one of the first of the original German Junkers type to be brought to this country, it is quite similar to the Bremen in general characteristics. This plane replaces the original BMW 300



Harvey Crawford's early model Junkers in use at Dyre Airport.

hp. engine while the Bremen used the 350 hp. engine. This plane, which is the property of Harvey Crawford, is still in excellent condition and is much in demand for racing purposes. The capacity of six passengers and two pilots at a maximum speed of 125 mph. has made it a popular transport plane at Dyre.

Operationally at Dyre Airport is largely centered around the rebuilding and installation of OK-X engines. Fifteen of these engines and a generous supply of replacement parts are on hand, and due to the excellence of the engine for the past five years Dyson has developed materials and methods making it possible to develop this engine from 80 to 100 hp. with a decrease in operating costs.

**Oakland, Calif.**

By James MacKenzie

The Matson Aircraft Co. is the latest organization to inaugurate regular daily serial passenger service between the Bay district and Los Angeles. The northern terminus is located on the Oakland side. The first plane recently took off from the Oakland field.

The University of California announces that students of the Los Angeles branch of the institution have formed an organization known as the Student Aero Club. This club has initiated a campaign to interest college men in aviation and is anticipating an inter-collegiate airplane meet to be held at Los Angeles next September.

The rapidity with which the Oakland Airport is growing, is surprising everyone. Journey of the year showed 2000 landings and takeoffs of WACO 18. In the four months since, landings have almost tripled to 6000 and average have more than doubled to show a figure of 3000+27.

The following figures tell the story:  
1931 LANDINGS PASSENGERS REVENUE  
November ..... 2002 756 \$ 350,00

December	1931	2002	799	\$65,00
	1932	2075	1308	1123,20
January	.....	2002	1000	1000,00
February	.....	2002	1000	1000,00
March	.....	1646	5078	5246,73
April	.....	6566	4514	3843,37

Mail arriving from Vancouver, Seattle and other northern ports which has hitherto been sent to San Francisco for distribution although intended for local residents is now to be forwarded direct to the Oakland Post Office. This enables East Bay residents to receive mail and the same day as received at the airport, saving a day in distribution formerly required due to the double handling.

**Long Beach, Calif.**

An airplane booster tour has recently been conducted throughout Southern California by the Long Beach, Calif., Chamber of Commerce. The purpose of this tour is to stimulate the Pacific Southwest Exposition opening on Long Beach on July 27. The feature of this exposition is to be the great exhibit of aircraft and models and accessories of all sorts pertaining to aviation.

**Seattle, Wash.**

By M. Conrad

W. E. Boeing and Phil G. Johnson, president of the Boeing Airplane Co., Seattle, have left Boeing Field for Chicago as one of the Transcontinental which has been in the factory a short time. The plane has a new Horner engine. From Chicago Boeing and Johnson will proceed east on a business trip.

With the aim of preserving in the annals of the University of Washington the winning letter in Seattle's record round-the-world air mail derby, members of the Alumni Association are planning to exhibit all private effects of Dr. E. L. Doherty, returned to Seattle recently after blasting nature and routes around the world, will be sold at auction at the Elks Water Circus to be held June 25.

M. E. Spokane, president of the university, and other college officials are urging the purchase of the historic letter for the permanent museum. Alumni are to make a pool bid for the letter.

With the aim of putting down an aviation business day in travel of air mail between Seattle and points East, the Varney Air Lines are coordinating a direct air mail connection between these sections, according to an announcement made by Claude V. O'Donnell, traffic manager of the company. The proposed under way, Mr. O'Donnell said, was for an extension of the Varney service from Picabo to Seattle, via the Colchuck River and Portland.

With the view of putting Ellensburg, Wash., on the air mail map, three members of the Ellensburg Chamber of Commerce visited Seattle recently to inspect the airport and arrange for the purchase of a plane to be used as an air mail between Ellensburg and neighboring cities.

The special committee stated that an option had been taken on a 160 acre tract at Ellensburg, to be developed as an airport. H. L. Anderson, Eddie Haynes, and Lewiston Gehres comprised the special committee.

Yeager Airways has announced the arrival of a new Lockheed-Piper plane, shipped by express from the factory in Kansas City, Mo. The craft will be used for instruction and passenger work.

**Yakima, Wash.**

The new airport for Yakima was dedicated on June 2, and the ceremonies were highlighted by the opening of the airplane service between Yakima and Portland, which has been postponed from May 25 to give time for the finishing touches required by the field. Officials of the Yakima Chamber of Commerce were in charge of the dedication, and a group of

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prominent Portland business men joined in the program, dog shows and other events were held and \$1600 in prizes and trophy cups awarded.

The celebration began at 7 A.M., when the first plane in the Yakima-Pearl Harbor series took off from the new field. It continued through the day, closing with a hall of the Yakima Army, with visiting airmen the guests of honor.

A feature of the day was the christening of the plane "Yakima," one of three to be used in the new series. Capt. Noah Baldwin of the Yakima Indians christened the plane:

### Husabrook Heights, N. J.

Leading horse breeders from the French Ministry for the Development of Agriculture visited the plant of the Atlantic Aircraft Corp. The distinguished guests were first met by Charles L. Lowrance, president of the Wright Aerocraft Corp., and they were shown over the airport and factory by Major Lenhard Spence, president of the Fokker Aircraft Corp.; Anthony H. G. Fisher, designer of the planes which bear his name; and R. H. C. Neasey, assistant to the president of the Atlantic Aerocraft Corp. and vice-president and general manager of the Teterboro Airport, Inc.

The guests showed interest in the performance of a Fokker Super Universal piloted by G. E. Hayes. Interest was also shown in a pair Fokker C-32 bienges, recently delivered to the factory. The plane is being built for J. S. Tolson, president of the Pacific Oil Co. of California.

Following the visit at the field, the French Mission turned to Paterson, N. J., to see the Wright Aerocraft Corp. plant.

L. F. Blinder, chief design engineer for the Fokker organization, upon his recent return from Wheeling, W. Va., reported satisfactory progress in the erection and completion of the new plant located there. Mackay is now being established, and the new factory will be ready for occupancy and operation by June 15. The Passaic plant of the Fokker Corporation has been increased 8,000 ft. sq., making the capacity of the exclusive Teterboro and Passaic plants, approximately 100,000 ft. sq., and the personnel of the Atlantic Aerocraft Corp. has again been increased considerably, to meet the demand for Fokker aircraft.

### Camden, N. J.

A. H. Kreider, president of the Kreider Reimer Aircraft Co., Inc., of Hagerstown, Md., piloted one of his company's new three-plane OX5 Challengers from the Kreider-Reimer field to the Cyclops Airplane Co. in Camden, N. J., where he opened a service bureau to Camden and Philadelphia and returned to the factory by train the following day. The Challenger he now has was purchased by Francis P. Lyman, sales representative for the Crescent Air Service, Inc., operator of the Crescent Airport.

Capt. E. D. C. Horne, who flew with the Royal Flying Corps during the World War and who now lives in South Jersey, has been a frequent visitor recently at the Crescent Airport. He has handled several important sky-writing contracts in this section as a representative of the Sky-Writing Corp. of America.

Several members of the House Naval Affairs Committee flew in the Crescent Airport, recently, to attend the seventh annual banquet of Capt. Raymond C. Tracy Post No. 47, American Legion. In the party were Edward P. Warren, Assistant Secretary of the Navy in Charge of Aeronautics; John W. A. Merton, Chief of the Bureau of Aeronautics; Adm. J. L. Lothrop, Commandant of the Fourth Naval District; Congressman Charles A. Wilson, of the First New Jersey District, and other members of the House committee. The visiting planes were escorted to the Crescent Airport

by planes of the Crescent Air Service. They were piloted by John J. Stevenson, the company's new chief pilot, and Capt. Harry Moore, World War hero and now chief instructor and pilot for the Crescent organization. Officials of the Legion post were passengers at both planes—O.S. S. Josephine Challengers.

### Furniture, Ore.

#### John W. Anderson

Capt. Jack Clemmons, chief pilot of the Army School has sent a telegram from Washington, D. C., authorizing a flight which he will soon make to break the altitude record in the OX5, a powered Travel Air biplane. Officials of the City Club of Oregon will accompany the flight. James Knobell, 23 yr. old state pilot has been building his own airplane, has just completed the first cockpit to be completed in Portland. It is of the剖面 type and will be used in passenger service at Astoria Beach Park this summer.

W. E. Anderson, business man of Boise, Idaho, is probably to fly east on the Northwest to operate a cabin plane for seven months exclusively. Anderson, who is a skipper, recently sold his boat and is flying from Tex Ranch in Porterville, Calif., west to his ranch in Idaho, Oregon, or Montana. The home airport will be Boise, Idaho, and a full time pilot will be employed by Anderson and his associate. This plane will carry four passengers.

### Tichum, Kas.

#### John W. Payne

The first leg in the negotiation of an adequate managerial contract for this city has been taken by the city commission via a formal meeting. They authorized a \$50,000 bond issue which to make the first payment on a section of land, which is to be called the "Citation section".

The present airport is the Travel Air factory, an only quarter acre. The city commissioners recently took into Capt. C. H. Hobbie's, in Wichita, making a survey of the 1500' stretch for the Wright Aerocraft Corp. of New Jersey, and that the present field will be inadequate for the planes of the Transcontinental Air Transport Inc. Wichita stands to lose her designation as a division point on the transcontinental train-plane route unless a larger field can be established within the next few weeks, he warned.

The total cost of the \$40,000 field will be \$10,000. Enclosure \$5000 ft. in length will be constructed. The field is six or one-half miles down the city, the same distance as the present field. It is virgin land, with natural drainage.

### Phoenix, Ariz.

#### Roy George

Much interest was shown by the aviation fans of Phoenix, Ariz., recently when a large Fokker F-20 plane landed at the Maricopa Airport, en route from New Jersey to Los Angeles. The plane, piloted by James King, attained much attention.

The city of Phoenix had been selected as one of the stops to be made by the plane by reason of its position on the southern transcontinental route, the remodeled airport, and the growing enthusiasm of the community in aviation. This plane is visited many of the principal cities of the country in a go-all-day tour sponsored by the Guggenheim Foundation. The purpose of the aeromotors not incidentally to advertise the limited airway passenger service between Los Angeles and San Francisco.

The visitors were met by a large delegation of Phoenixites to give the pilot and his seven passengers, including David E. L. Jr., representative of the Western Air Express, Hugh Mills, chief test pilot of the Fokker manufacturer and navigation pilot of the plane, Henry G. Mohr, manager of the

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June 11, 1952

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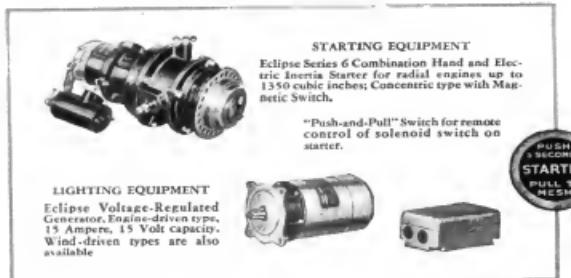
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